

# **FACT SHEET FOR NPDES PERMIT WA-0093317**

## **Spokane County Regional Water Reclamation Facility (SCRWRF)**

### **PURPOSE of this Fact Sheet**

This fact sheet explains and documents the decisions Ecology made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) Permit for the Spokane County Regional Water Reclamation Facility (SCRWRF).

This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit *and accompanying fact sheet* for public evaluation before issuing an NPDES permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for the Spokane County Regional Water Reclamation Facility NPDES Permit WA-0093317, are available for public review and comment from June 28, 2011 until August 29, 2011. For more details on preparing and filing comments about these documents, please see **Appendix A - Public Involvement**.

Spokane County Utilities and CH2M Hill reviewed the draft fact sheet for factual accuracy. Ecology corrected any errors or omissions regarding the facility's location, history, discharges, or receiving water.

After the public comment period closes, Ecology will summarize substantive comments and provide responses to them. Ecology will include the summary and responses to comments in this Fact Sheet as **Appendix E - Response to Comments**, and publish it when issuing the final NPDES Permit. Ecology will not revise the rest of the fact sheet, but the full document will become part of the legal history contained in the facility's permit file.

### **SUMMARY**

The Spokane County Regional Water Reclamation Facility (SCRWRF) is an advanced wastewater treatment plant. It will provide an initial 8 million gallons per day (MGD) of capacity with an ability to expand capacity in phases up to 24 MGD. Spokane County owns and is financing the Facility. CH2M Hill Constructors, Inc. designed and built the facility, and will operate, maintain, and repair the Facility for an initial 20-year period. CH2M Hill Constructors, Inc. will be responsible for on-site biosolids treatment. The County constructed improvements to the conveyance system, including the force mains, pump stations and the outfall for the Facility, as separate public works projects. The Facility includes a treatment process incorporating a step-feed nitrification/denitrification membrane bioreactor with the following key components: fine screening, grit removal, primary clarification, sodium hypochlorite disinfection, gravity belt thickening for primary and waste activated sludge, anaerobic digestion, aerobic digestion/solid storage, centrifuge dewatering, and chemical feed systems. Other facilities include odor control, an administration building with a laboratory, a water resource center, and a maintenance building.

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## **I. INTRODUCTION**

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES), administered by the federal Environmental Protection Agency (EPA). The EPA authorized the State of Washington to manage the NPDES permit program in our state. Our state legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The legislature defined Ecology's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington).

The following regulations apply to municipal NPDES permits:

- Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC)
- Technical criteria for discharges from municipal wastewater treatment facilities (chapter 173-221 WAC)
- Water quality criteria for surface waters (chapter 173-201A WAC) and for ground waters (chapter 173-200 WAC)
- Sediment management standards (chapter 173-204 WAC)
- Submission of Plans and Reports for Construction of Wastewater Facilities (Chapter 173-240 WAC)

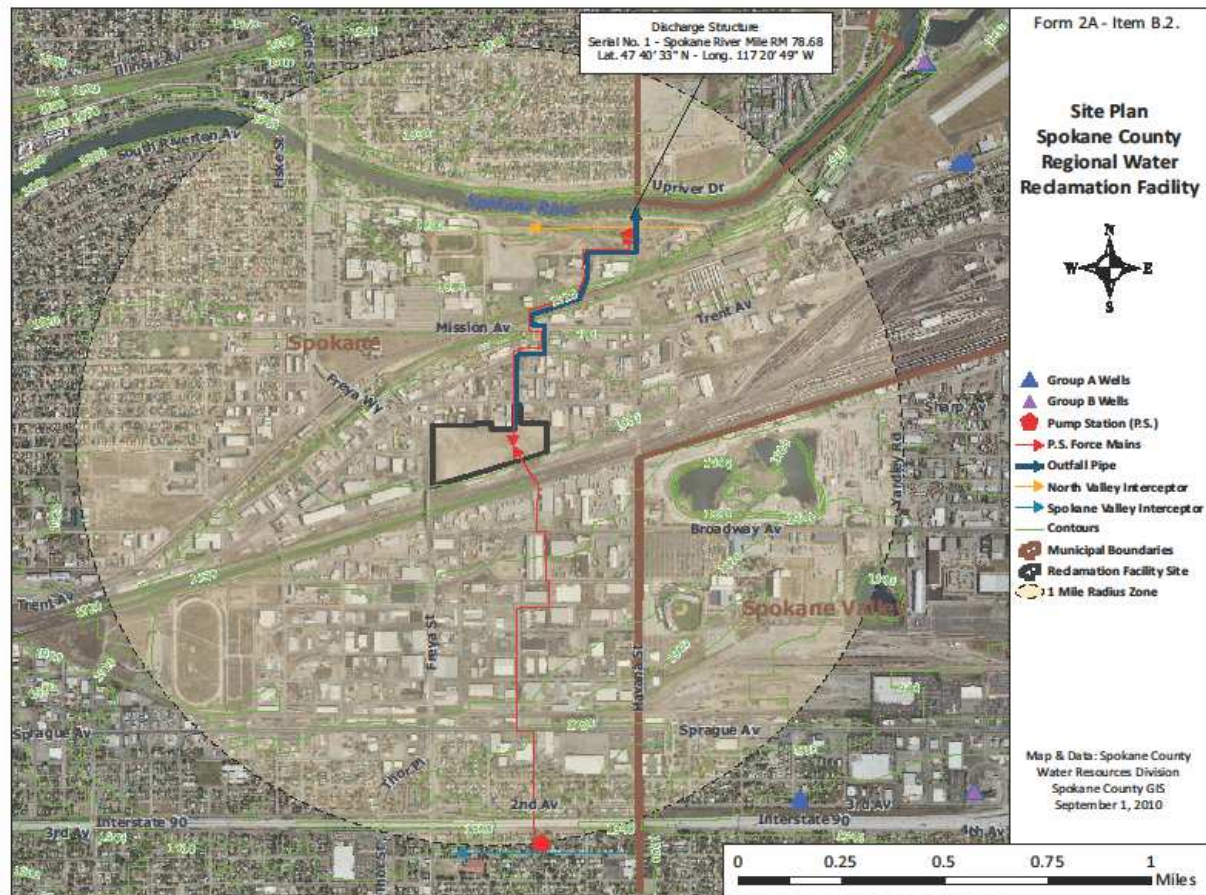
These rules require any treatment facility operator to obtain an NPDES permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for requirements imposed by the permit.

Under the NPDES permit program and in response to a complete and accepted permit application, Ecology must prepare a draft permit and accompanying fact sheet, and make them available for public review before final issuance. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments, during a period of thirty days (WAC 173-220-050). (See **Appendix A - Public Involvement** for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft NPDES Permit. Ecology will summarize the responses to comments and any changes to the permit in **Appendix E**.

## II. BACKGROUND INFORMATION

**Table 1: General Facility Information**

Applicant:	Spokane County Utilities
Facility Name and Address:	Spokane County Regional Water Reclamation Facility 1004 North Freya Street Spokane, WA 99202
Type of Treatment:	Step-feed nitrification/denitrification membrane bioreactor with chemical phosphorus removal and the following key components: fine screening, grit and scum removal, primary clarification, sodium hypochlorite disinfection, dechlorination, gravity belt thickening for primary and waste activated sludge, anaerobic digestion, aerobic digestion/solid storage, centrifuge dewatering, chemical feed systems and odor control systems.
Discharge Location:	Spokane River Latitude: 47.675833 N Longitude: -117.346944 W
Facility Contact:	John Keady, Operator 1004 N. Freya Street Spokane, WA 99202 (509) 536-3701
Responsible Official:	N. Bruce Rawls, P.E.; Utilities Director 1026 W. Broadway Spokane, WA 99260 (509) 477-3604



**Figure 1: Facility Location Map**

## A. Facility Description

### History

Sewer service by Spokane County Utilities began in the 1970's with studies to determine impacts of wastewater in the urbanizing portions of the county. The first comprehensive wastewater management plan was in 1981.

The County began a program in 1980 to eliminate septic tanks and connect customers to the County's sewer system to protect the Spokane Aquifer. Since the program began, over 38,000 customers have connected including approximately 25,000 septic tank conversions. This sewer expansion program is projected to continue through the year 2015 to provide wastewater service to all existing development within the County's sewer service area. By 2015, it is expected that approximately 9,000 additional existing septic tank customers will connect to the sewer system.

The planning area for Spokane County Utilities is divided into the 8,359-acre North Spokane section and the 31,103-acre Spokane Valley section (see Figures 2 & 3 Spokane County Utilities Service Area).

Two major interceptors further divide the Spokane Valley section into the "North Valley Service Area" and the "Spokane Valley Service Area."

Planning for the Spokane County Regional Water Reclamation Facility began with the 2001 Comprehensive Wastewater Management Plan. The construction is proceeding as a design build operate contract as authorized by Chapter 70.150 RCW Water Quality Joint Development Act.

The initial construction project is an 8 MGD water reclamation facility designed to meet the requirements of the Spokane River and Lake Spokane DO TMDL and more. The second phase will expand the facility to 12 MGD in approximately the year 2030. The County also owns 10 MGD of capacity at the City's Riverside Park Water Reclamation Facility (RPWRF), 6.5 MGD of which currently comes from the valley area. When the valley area growths and flows exceed 8 MGD, the excess will go to the RPWRF until the phase 2 expansion is completed. The site has been laid out for incremental expansions to accommodate up to 24 MGD annual average flow.

Construction of the facility is proceeding with startup and testing commencing in August 2011 and a projected discharge to the Spokane River likely by December 2011.

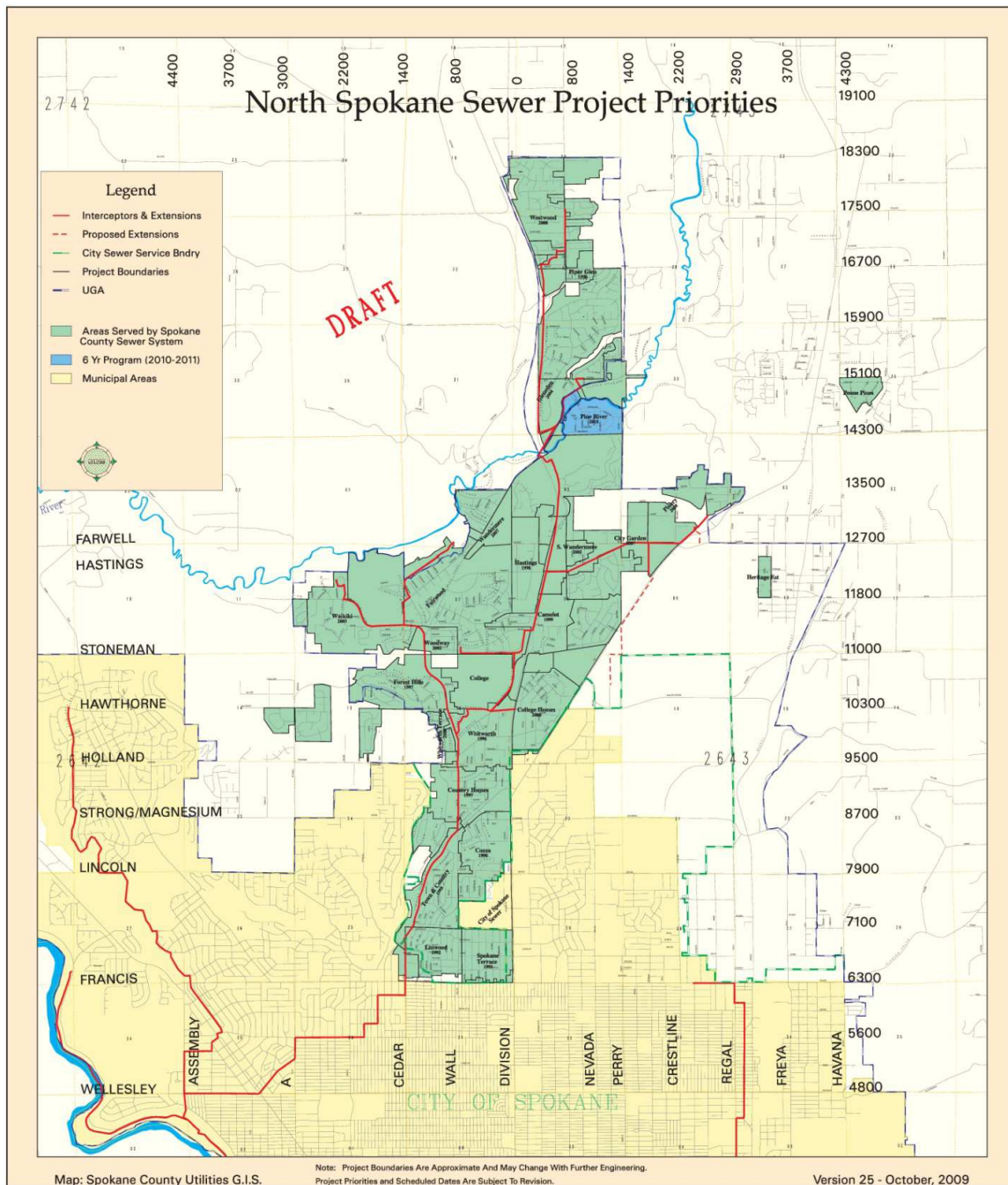
### **Collection System Status**

The collection system is relatively new and has been built principally of PVC pipe. The system's infiltration and inflow is minimal. It is also a separated system versus the combined storm water and sewerage system found in parts of the City of Spokane. Comparing current estimated population to measured flow, the gallons per capita per day (gpcd) is 80.5

The County collection system is connected to the City of Spokane interceptor system and Riverside Park Water Reclamation Facility. Wastewater that is not diverted to the Spokane County Regional Water Reclamation Facility will flow to the Riverside Park Water Reclamation Facility. Additionally, provisions have been made to allow effluent discharge from the Spokane County Regional Water Reclamation Facility to be routed back to the interceptor system and the Riverside Park Water Reclamation Facility. It is anticipated that this arrangement may be used during commissioning and startup of the Spokane County Regional Water Reclamation Facility. The County's North Spokane Interceptor also flows to the Riverside Park Water Reclamation Facility.

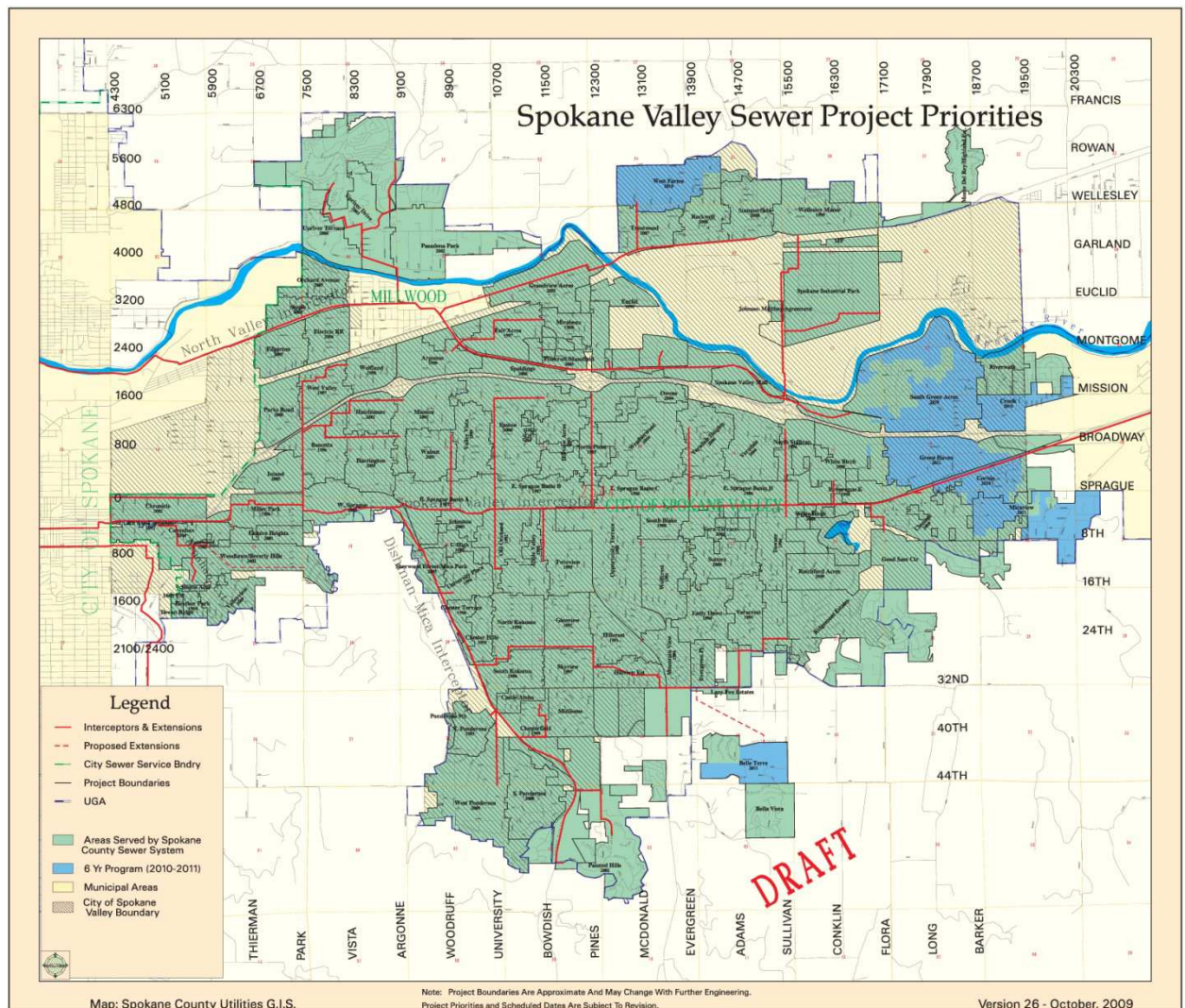


**Figure 2: A Map of the County's North Spokane Service Area**





**Figure 3: A Map of the Spokane Valley Service Area**



## Treatment Processes

The Spokane County Regional Water Reclamation Facility (SCRWRF) will provide advanced wastewater treatment to an initial 8 MGD of wastewater with an ability to expand capacity in phases up to 24 MGD. Spokane County will own and finance the Facility. CH2M Hill Constructors, Inc. will design and build the Facility, and will operate, maintain, and repair the Facility for an initial 20-year period. CH2M Hill Constructors, Inc. will also be responsible for on-site biosolids treatment. The County has selected a firm to haul the biosolids from the facility but contract details are not yet finalized. Several biosolids management alternatives have been considered including land application and composting.

The County has constructed improvements to the conveyance system, including the force mains, pump stations and the outfall for the Facility, as separate public works projects. The Facility includes a treatment process incorporating a step-feed nitrification/denitrification membrane bioreactor with chemical phosphorus removal and the following key components: fine screening, grit removal, primary clarification, sodium hypochlorite disinfection, liquid sodium bisulfite dechlorination, gravity belt thickening for primary and waste activated sludge, anaerobic digestion, aerobic digestion/solid storage, centrifuge dewatering, chemical feed systems and odor control systems. Sludge digestion employs both anaerobic and aerobic processes to further reduce effluent nitrogen content, reduce solids production and improve sludge quality. Other on-site facilities include an administration building with a laboratory, a water resource center, and a maintenance building.

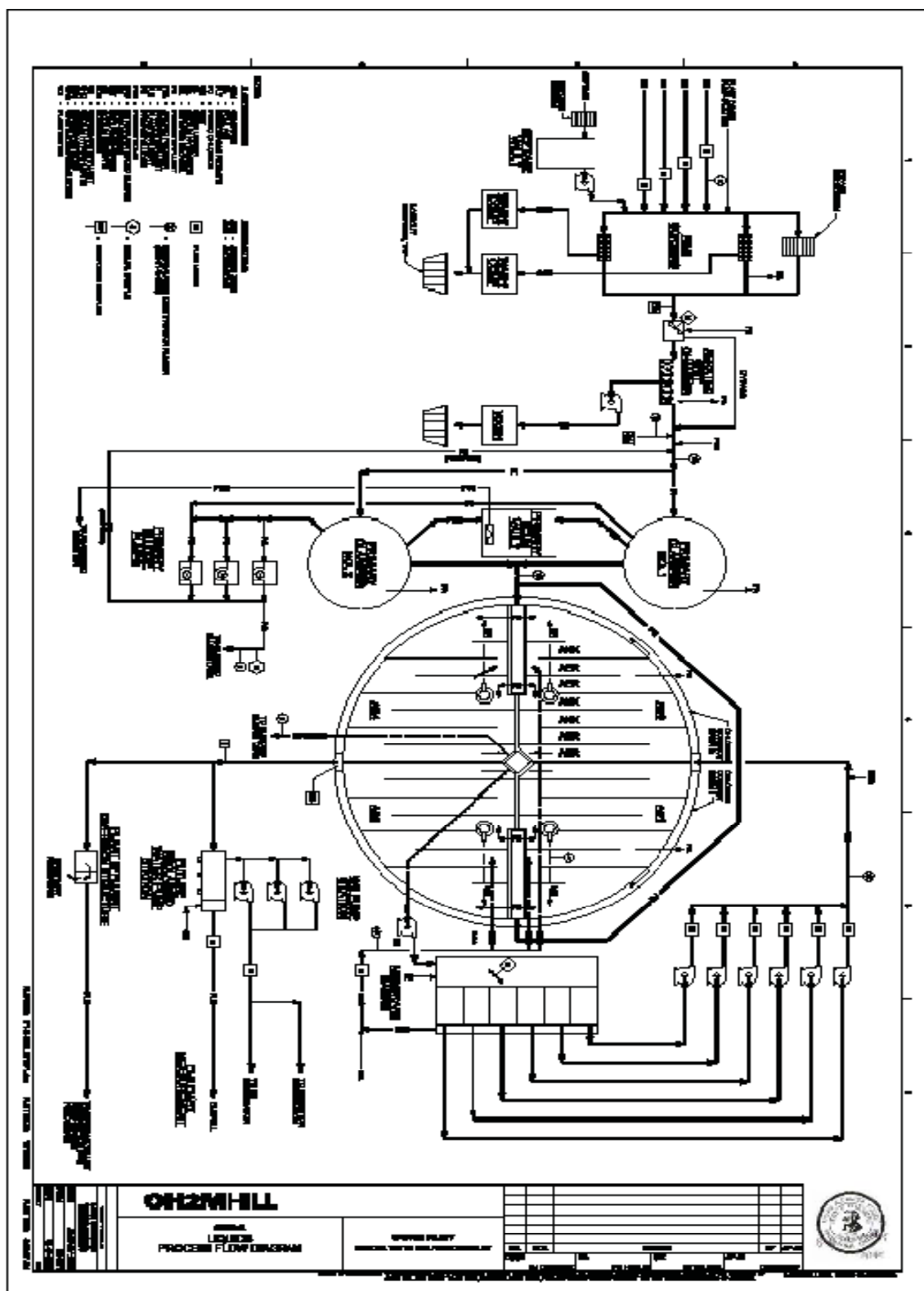
As an activated sludge treatment facility providing tertiary treatment (nitrification/denitrification with phosphorus removal) over 5 MGD the facility will be a Class IV facility.

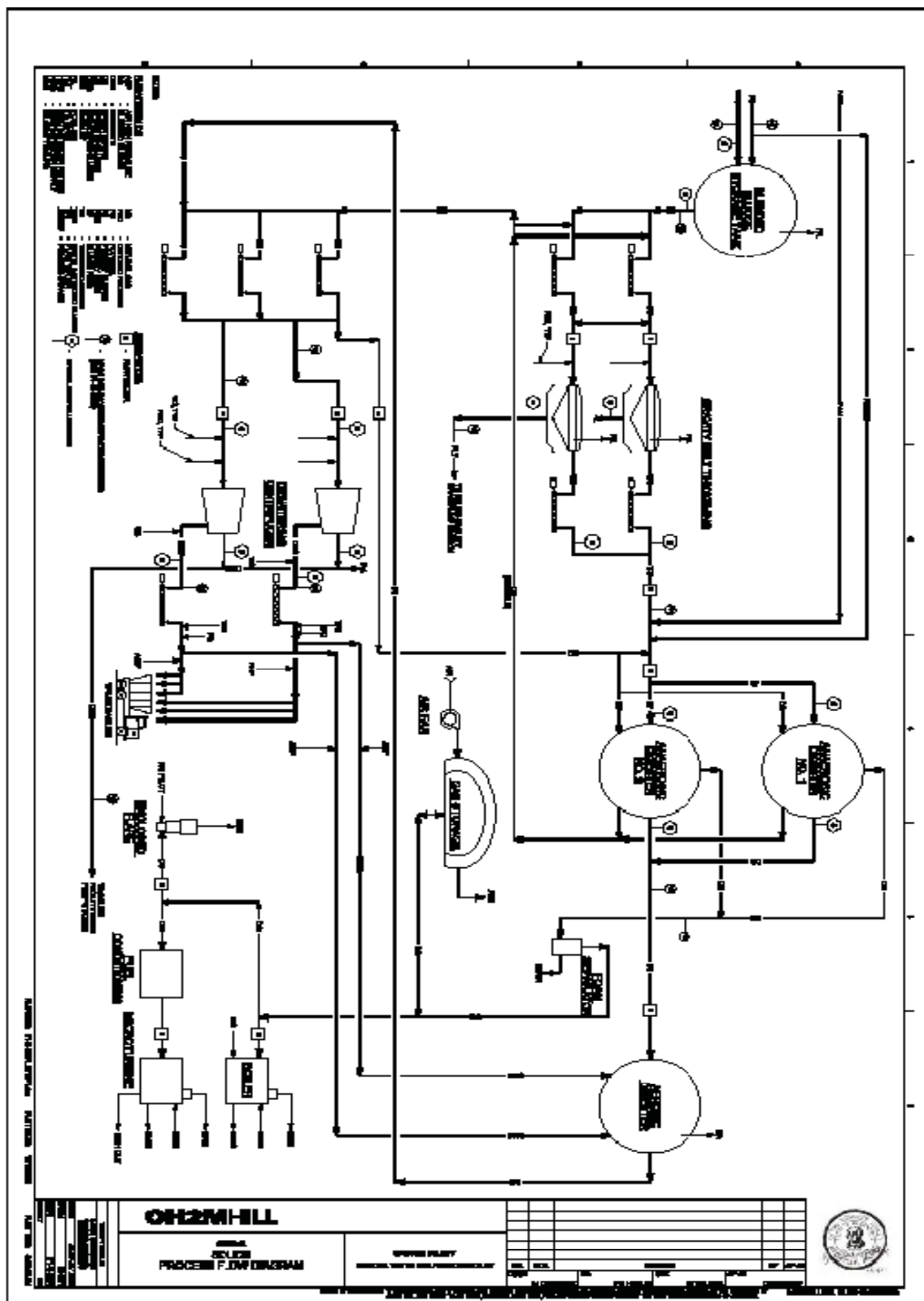
The portion of the County system in Spokane Valley has 2 Significant Industrial Users (SIUs) and 6 Categorical Industrial Users (CIUs).

### **Discharge Outfall**

The treated, disinfected and dechlorinated effluent will flow into the Spokane River through a 36-inch diameter duckbill style Tideflex valve. The outfall extends north into the river about 75 feet beyond the ordinary high water level on the south bank of the river. The top of the pipe is roughly 15 feet below the ordinary high water. At the outfall location the river width varies from about 200 feet to 150 feet depending on river flow.

**Figure 4: Schematics Diagrams of the Liquid and Solids Process Trains**





## **Solid Wastes**

The treatment facilities remove solids during the treatment of the raw wastewater at the headworks (grit and screenings), in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum, and screenings are drained and disposed of as solid waste at the local landfill. Sludges removed from the primary clarifier and secondary treatments system are thickened and treated.

The solids process train is: gravity belt thickening for primary and waste activated sludge, anaerobic digestion, aerobic digestion/solid storage, and centrifuge dewatering. Spokane County evaluated several options for Biosolids management, including negotiation of an agreement with the City of Spokane to have the County biosolids land applied on the same land as the City. The selected option is composting at the Barr-Tech facility in Lincoln County. However, the details of a contract between the County and a joint contract CH2M-Hill and Barr-Tech are still being negotiated. A backup plan with Parker Ag is also being pursued.

## **B. Permit Status**

This is a new, previously unpermitted facility. The existing wastewater is currently treated at the City of Spokane's Riverside Park Reclaimed Water Facility and discharged to the Spokane River.

The treatment facility is owned by the county and designed, built, operated and maintained by a contractor, CH2M-Hill Constructors, Inc. As such, Ecology must decide whether to issue the permit to each entity as co-permittees or to the County alone. The contract between Spokane County and CH2M-Hill Constructors, Inc. has been reviewed by Ecology and judged to provide adequate definition of responsibilities between the contracting parties. The responsibilities are found to be protective of water quality and in accord with Chapter 70.150 RCW. The permit will be issued to Spokane County, Utilities Division.

Spokane County Utilities Division submitted an application for a permit on September 30, 2010. Ecology accepted it as complete on October 15, 2010.

## **C. Wastewater Characterization**

The expected concentration of pollutants in the discharge was reported in the NPDES permit application, the DBO performance guarantee, Appendix 10; and the June 2010 engineering report. The tabulated data represents the anticipated quality of the effluent to be discharged. The effluent is characterized as follows:

**Table 2: Wastewater Characterization**

Parameter	Average Concentration	Maximum Concentration
CBOD <sub>5</sub>	--	2 mg/L
TSS*	<30 mg/L	--
Ammonia – N, March through May and October	1 mg/L	--
Ammonia – N, June through September	0.25 mg/L	--
Total Phosphorus, seasonal average	0.05 mg/L	--
* The treatment technology selected utilizes membranes producing a CBOD <sub>5</sub> of less than 2 mg/L and typically a TSS with a comparable single digit concentration.		

#### **D. SEPA Compliance**

To meet the intent of SEPA, an existing, unpermitted discharge must undergo SEPA review during the permitting process. The County filed a SEPA checklist and SERP environmental review documents (EIS) for federal funding with Ecology initially in February 2003 with updates in April 2004, and December 2006. Ecology issued a determination of non-significance for the project in February 2003. With the DO TMDL approved, the County submitted the final wastewater facilities amendment June 2010 and a final SERP concurrence was initiated. The Department of Archaeology and Historic Preservation (DAHP) issued their Determination of No Historic Properties affected on June 1, 2010.

The USEPA issued a determination of no effect on ESA listed species on November 11, 2010. Ecology reviewed the documentation and issued a SERP compliance determination on December 23, 2010.

### **III. PROPOSED PERMIT LIMITS**

Federal and state regulations require that effluent limits in an NPDES permit must be either technology- or water quality-based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).
- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36).



- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Nor does Ecology usually develop limits for pollutants that were not reported in the permit application but that may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. If significant changes occur in any constituent of the effluent discharge, or if other constituents are identified in effluent monitoring, Spokane County is required to notify Ecology (40 CFR 122.42(a)). Spokane County could potentially be in violation of the permit until Ecology modifies the permit to reflect the additional discharge of pollutants.

#### **A. Design Criteria**

Under WAC 173-220-150 (1)(g), flows and waste loadings must not exceed approved design criteria. Ecology-approved design criteria for this facility's treatment plant were obtained from the engineering report/facility plan/plans & specifications prepared by HDR, Inc. and CH2M Hill Constructors, Inc.

**Table 3: Design Loading Criteria for the SCRWRF**

<b>Parameter</b>	<b>Design Quantity</b>
Monthly Average Flow	8.0 MGD
Maximum Month Design Flow (MMDF)	8.5 MGD
Peak Design Flow (Peak Hour)	13.8 MGD
BOD <sub>5</sub> loading for maximum month	18,270 lbs/day
TSS loading for maximum month	20,080 lbs/day
Orthophosphate PO <sub>4</sub> -P	281 lbs/day
Total Phosphorus TP	603.1 lbs/day
Ammonia NH <sub>4</sub> -N	1,967 lbs/day
Total Nitrogen TN	2,978 lbs/day

#### **B. Technology-Based Effluent Limits**

Federal and state regulations define technology-based effluent limits for municipal wastewater treatment plants. These effluent limits are given in 40 CFR Part 133 (federal) and in chapter 173-221 WAC (state). These regulations are performance standards that constitute all known, available, and reasonable methods of prevention, control, and treatment (AKART) for municipal wastewater.

Chapter 173-221 WAC lists the following technology-based limits for pH, fecal coliform, BOD<sub>5</sub>, and TSS:

**Table 4: Technology-Based Limits**

Parameter	Limit
pH	The pH must measure within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD <sub>5</sub> (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

The above technology based limits are generally superseded by the requirement of the Spokane River and Lake Spokane DO TMDL directly (such as CBOD) or indirectly (such as TSS).

### C. Surface Water Quality-Based Effluent Limits

#### Description of the Receiving Water

The Spokane County Regional Water Reclamation Facility will discharge to the Spokane River at river mile 78.7 (lat 47° 40' 33" long. 117° 20' 49"). Other nearby point sources are:

- Downstream outfalls for the City of Spokane are CSO outfalls 40, 39 and 38,
- CSO 41 which is directly across the river from the County's outfall (a storage tank is to be installed in 2011),
- Inland Empire Paper outfall which is roughly 4 miles east or upstream.

In 1998, Ecology developed a Dissolved Metals TMDL for Zinc, Lead and Cadmium. The TMDL for Dissolved Oxygen was approved in May 2010. The Spokane River is also listed for PCBs and Ecology has published a reduction strategy *Reducing Toxics in the Spokane River Watershed*, August 2009 that includes PCBs.

The conventional ambient background data used for this permit includes the following from the Environmental Assessment Program's monitoring station 57A140 at the Plante's Ferry foot bridge at river mile 84.7. Finalized data exists for 2008 and 2009.

**Table 5: Conventional Ambient Background Data**

Parameter	Value Used
Temperature (highest annual 1-DADMax)	18.1° C
Temperature (highest annual 7-DADMax)	NA
Temperature (**some waterbodies have specific temperature criteria as assigned in Table 602)	20° C
pH (Maximum / Minimum)	8.06/7.58
Dissolved Oxygen	12.86 to 8.3 mg/L
Total Ammonia-N	No more than 0.019 mg/L
Fecal Coliform	21/100 mL dry weather (180/100 mL storm related)
Turbidity	1 NTU

The City of Spokane has done monitoring of fecal coliforms at Plantes Ferry during storm events. The highest storm related fecal coliform count was 240/100 ml on 9/17/2004.

The metal data is from monitoring station 57A150 at state line.

**Table 6: Ambient Background Data for Metals**

Parameter	Value used
Hardness	23.9 mg/L as CaCO <sub>3</sub>
Alkalinity*	21 mg/L as CaCO <sub>3</sub>
Lead	2 µg/L
Copper	1.0 µg/L
Zinc	53 µg/L
Cadmium	0.22 µg/L
*The alkalinity data was extracted from the EIM data base and is from Greg Pelletiers metal study, <i>Cadmium, Copper, Mercury, Lead and Zinc in the Spokane River</i> , (Publication 94-09) published in 1994.	

The following data is from the draft report “*Spokane River PCB Source Assessment 2003-2007*.”

**Table 7: Ambient Background Data for PCBs (Recheck)**

Location description	River Mile	Mean Total PCB concentration in the water column, pg/L
Stateline	96.1	106
Upriver Dam	80.3	77
Monroe St.	74.8	199
Nine Mile	63.6	311

Nine Mile (2008)*	58.1	90
Lower Lake Spokane	38.4	399
*Trend Monitoring for Chlorinated Pesticides, PCBs, PAHs, and PBDEs in Washington Rivers and Lakes, 2008 sampling location at Nine Mile Dam RM 58.1 on 5/9/08 & 9/10/08.		

The Washington State Surface Water Quality Standards (chapter 173-201A WAC) are designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet the surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily load study (TMDL).

### **Numerical Criteria for the Protection of Aquatic Life and Recreation**

Numerical water quality criteria are listed in the water quality standards for surface waters (chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

### **Numerical Criteria for the Protection of Human Health**

The U.S. EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (EPA 1992). These criteria are designed to protect humans from exposure to pollutants linked to cancer and other disease, based on consuming fish and shellfish and drinking contaminated surface waters. The water quality standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

### **Narrative Criteria**

Narrative water quality criteria (e.g., WAC 173-201A-240(1); 2006) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-200, 2006) and of all marine waters (WAC 173-201A-210, 2006) in the State of Washington.

## **Antidegradation**

The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330; 2006) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions. Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest.

Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

A facility must prepare a Tier II analysis when all three of the following conditions are met:

- The facility is planning a new or expanded action. This condition applies to the new county treatment facility.
- Ecology regulates or authorizes the action. This condition applies to the new county treatment facility.
- The action has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.

However, the ambient water quality of the Spokane River is not better than the water quality standards human health criterion for PCBs. Long term trend monitoring does show decreasing PCB concentrations. The tertiary treatment processes under construction will further decrease concentrations of PCBs and other toxicants in the Spokane River. The tertiary treatment processes under construction is designed to comply with the requirements of the DO TMDL and will generally improve DO concentrations in the Spokane River.

The issuance of an NPDES permit will not cause measurable degradation but will further ongoing improvements in water quality.

A tier II analysis is not required.

This facility must meet Tier I requirements.

- Dischargers must maintain and protect existing and designated uses. Ecology must not allow any degradation that will interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.

Ecology's analysis described in this section of the fact sheet demonstrates that the existing and designated uses of the receiving water will be protected under the conditions of the proposed permit implementing the Spokane River and Lake Spokane DO TMDL, the Spokane River Dissolved Metals Total Maximum Daily Load. However, the Spokane Tribe's human health criterion for PCBs is problematic, given that the standard of 3.37 pg/L is below current method detection limits used in the report "*Spokane River PCB Source Assessment 2003-2007*." The reporting limit given was 100 pg/L (table 16 of the report).

The treatment technology selected to ensure compliance with the Spokane River and Lake Spokane DO TMDL will also ensure compliance with dissolved metals TMDL. For total PCB, the chronic fresh water criterion for aquatic organisms is 14,000 pg/L, the human health criterion from the National Toxics Rule (NTR) is 170 pg/L and the downstream tribal human health standard is 3.37 pg/L.

Currently the Spokane conventional secondary wastewater treatment facilities (Liberty Lake S&W District and Riverside Park Water Reclamation Facility) have estimated effluent concentrations that range from about 110 pg/L to about 2,400 pg/L, though the treatment processes themselves are not sources. While tertiary treatment will further reduce the effluent concentrations, how much is uncertain until further effluent data is available from the upgraded and operational advanced wastewater treatment which will be designed to comply with the requirements of the Spokane River and Lake Spokane DO TMDL. Also, while PCBs are considered a legacy pollutant and are prohibited in many products, the ban is not universal and many products currently in use continue to be sources of PCBs. For example, TOSCA allows PCBs in many currently used products such as paints, caulking and ink. By itself, no currently available treatment technology is likely to provide adequate removal sufficient to comply with either state water quality standard for PCBs or the more stringent tribal water quality standard. A broader, more comprehensive approach is needed. Aggressive toxic source identification, control and reduction or elimination is an essential part of the strategy. The County has floated the concept of a regional task force to attack the toxic issue and the concept has support from most stakeholders in the watershed. The rudiments of a Regional Toxics Task Force are described in the permit, but many details are left for the NPDES permittees and other stakeholders to cooperatively develop.



For a carcinogen the harmonic mean flow is used for calculating a dilution factor. The harmonic mean dilution factor is 35.7 for the new County facility (see table 12). The resulting PCB concentration in the water column could be less than the PCB concentration coming across the state line but still above the tribal standard. Where it specifically lies will depend on actual treatment efficiency and source control effectiveness and scope.

### **Mixing Zones**

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones the pollutant concentrations may exceed water quality numeric standards, so long as the discharge does not interfere with designated uses of the receiving water body (for example, recreation, water supply, and aquatic life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric standards.

State and federal rules allow mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology defines mixing zone sizes to limit the amount of time any exposure to the end-of-pipe discharge could harm water quality, plants, or fish.

The state's water quality standards allow Ecology to authorize mixing zones for the facility's permitted wastewater discharges only if those discharges already receive all known, available, and reasonable methods of prevention, control, and treatment (AKART) which will be case once the County's treatment facility is operational. Mixing zones typically require compliance with water quality criteria within a specified distance from the point of discharge and use no more than 25% of the available width of the water body for dilution. Ecology uses modeling to estimate the amount of mixing within the mixing zone. Through modeling Ecology determines the potential for violating the water quality standards at the edge of the mixing zone and through that process derives any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to occur (see Ecology's *Permit Writer's Manual*). Each critical condition parameter, by itself, has a low probability of occurrence and the resulting dilution factor is conservative. The term "reasonable worst-case" applies to these values.

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 10 means the effluent is 10% and the receiving water is 90% of the total volume of water at the boundary of the mixing zone. Ecology uses dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria, such as for PCBs. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

Each aquatic life **acute** criterion is based on the assumption that organisms are not exposed to that concentration for more than one hour and more often than one exposure in three years. Each aquatic life **chronic** criterion is based on the assumption that organisms are not exposed to that concentration for more than four consecutive days and more often than once in three years.

The two types of human health-based water quality criteria distinguish between those pollutants linked to non-cancer effects (non-carcinogenic) and those linked to cancer effects (carcinogenic) such as PCBs. The human health-based water quality criteria incorporate several exposure and risk assumptions. These assumptions include:

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two liters/day for drinking water
- A one-in-one-million cancer risk for carcinogenic chemicals.

This permit authorizes a small acute mixing zone, surrounded by a chronic mixing zone around the point of discharge (WAC 173-201A-400). The water quality standards impose certain conditions before allowing the discharger a mixing zone:

**1. Ecology must specify both the allowed size and location in a permit.**

The proposed permit specifies the size and location of the allowed mixing zone.

For this discharge, the percent volume restrictions of the water quality standards resulted in a lower dilution factor than the distance and width restrictions. Therefore, the dilution factor calculated at a 10-year low flow was used to determine reasonable potential to exceed water quality standards. To design the outfall, the County's consultant followed Ecology's guidance and rules.

**2. The facility must fully apply "all known, available, and reasonable methods of prevention, control and treatment" (AKART) to its discharge.**

Ecology has determined that the treatment provided at the Spokane County Regional Water Reclamation Facility employs treatment process going well beyond the requirements of AKART (see "Technology based Limits").

**3. Ecology must consider critical discharge conditions.**

Surface water quality-based limits are derived for the waterbody's critical condition (the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or designated waterbody uses). The critical discharge condition is often pollutant-specific or waterbody-specific.

Critical discharge conditions are those conditions that result in reduced dilution or increased effect of the pollutant. Factors affecting dilution include the depth of water, the density stratification in the water column, the currents, and the rate of discharge. Density stratification is determined by the salinity and temperature of the receiving water. Temperatures are warmer in the surface waters in summer. Therefore, density stratification is generally greatest during the summer months. Density stratification affects how far up in the water column a freshwater plume may rise. The rate of mixing is greatest when an effluent is rising. The effluent stops rising when the mixed effluent is the same density as the surrounding water. After the effluent stops rising, the rate of mixing is much more gradual. Water depth can affect dilution when a plume might rise to the surface when there is little or no stratification. Ecology's *Permit Writer's Manual* describes additional guidance on criteria/design conditions for determining dilution factors. The manual can be obtained from Ecology's website at <http://www.ecy.wa.gov/biblio/92109.html>.

Ambient data at critical conditions in the vicinity of the outfall is found in the '*Spokane River and Lake Spokane Dissolved Oxygen TMDL*' report approved in May 2010.

The outfall was designed using the following critical conditions:

- Water depth at summer 7Q20 flow of about 16.2 feet. (figure 1 in TM)
- At summer 7Q20 flow the average ambient current speed is 0.38 fps or 0.116 m/sec. At a winter 7Q20 flow the average ambient current speed is 0.65 fps or 0.198 m/sec. (sec 4.2.4 in TM)
- 1 Day MAX Effluent temperature of 18.4 degrees C.

**Table 8: Design Flows for SCRWRf Outfall (MGD)**

Criterion	2012	2030	2060	Ultimate
Average Day	8.0	12.0	16.0	24.0
Maximum Month	8.5	12.6	16.8	25.2
Maximum Day	12.1	17.8	24	36.0
Peak Hour	18.4	26.4	36.4	52.8

**4. Supporting information must clearly indicate the mixing zone would not:**

- **Have a reasonable potential to cause the loss of sensitive or important habitat.**
- **Substantially interfere with the existing or characteristic uses.**
- **Result in damage to the ecosystem.**
- **Adversely affect public health.**

Ecology established Washington State water quality criteria for toxic chemicals using EPA criteria. EPA developed the criteria using toxicity tests with numerous organisms and set the criteria to generally protect the species tested and to fully protect all commercially and recreationally important species.

EPA sets acute criteria for toxic chemicals assuming organisms are exposed to the pollutant at the criteria concentration for one hour. They set chronic standards assuming organisms are exposed to the pollutant at the criteria concentration for four days. Dilution modeling under critical conditions generally shows that both acute and chronic criteria concentrations are reached within minutes of being discharged.

The discharge plume does not impact drifting and non-strong swimming organisms because they cannot stay in the plume close to the outfall long enough to be affected. Strong swimming fish could maintain a position within the plume, but they can also avoid the discharge by swimming away. The SCRWRP discharge plume is small and the presence of a strong swimming fish for long is minimal. Mixing zones generally do not affect benthic organisms (bottom dwellers) because the buoyant plume rises in the water column. Ecology has additionally determined that the temperature of the water will not create lethal conditions or blockages to fish migration.

Ecology evaluates the cumulative toxicity of an effluent by testing the discharge with whole effluent toxicity (WET) testing.

Ecology reviewed the above information, the specific information on the characteristics of the discharge, the receiving water characteristics and the discharge location. Based on this review, Ecology concluded that the discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in damage to the ecosystem, or adversely affect public health if the permit limits are met.

**5. The discharge/receiving water mixture must not exceed water quality criteria outside the boundary of a mixing zone.**

Ecology conducted a reasonable potential analysis using procedures established by the EPA and by Ecology for each pollutant and concluded the discharge/receiving water mixture will not violate water quality criteria outside the boundary of the mixing zone if permit limits are met.

**6. The size of the mixing zone and the concentrations of the pollutants must be minimized.**

At any given time, the effluent plume uses only a portion of the acute and chronic mixing zone, which minimizes the volume of water involved in mixing. The plume rises through the water column as it mixes, therefore much of the receiving water volume at lower depths in the mixing zone may not mix with discharge. The County installed a duckbill style diffuser for mixing.

When a diffuser is installed, the discharge is more completely mixed with the receiving water in a shorter time. Ecology also minimizes the size of the mixing zone (in the form of the dilution factor) using design criteria with a low probability of occurrence. For example, Ecology uses the expected 95<sup>th</sup> percentile pollutant concentration, the 90<sup>th</sup> percentile background concentration, the centerline dilution factor, and the lowest flow occurring once in every ten years to perform the reasonable potential analysis.

Because of the above reasons, Ecology has effectively minimized the size of the mixing zone authorized in the proposed permit.

**7. Maximum size of mixing zone.**

The authorized mixing zone does not exceed the maximum size restriction.

**8. Acute Mixing Zone.**

- **The discharge/receiving water mixture must comply with acute criteria as near to the point of discharge as practicably attainable.**

Ecology requires that the acute criteria will be met at 10% of the volume of the chronic mixing zone at the ten year low flow. The design accommodates this requirement.

- **The pollutant concentration, duration, and frequency of exposure to the discharge will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.**

As described above, the toxicity of any pollutant depends upon the exposure, the pollutant concentration, and the time the organism is exposed to that concentration. Authorizing a limited acute mixing zone for this discharge assures that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water, assuring that the rising effluent will not cause translocation of indigenous organisms near the point of discharge (below the rising effluent). The plume is also small and will not cause translocation of indigenous organisms near the point of discharge.

- **Comply with size restrictions.**

The mixing zone authorized for this discharge complies with the size restrictions published in chapter 173-201A WAC.

**9. Overlap of Mixing Zones.**

This mixing zone does not overlap another mixing zone. No other outfall is in close enough proximity. The only nearby outfall is the other side of the river and flow is very intermittent.

#### D. Designated Uses and Surface Water Quality Criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. In addition, the U.S. EPA set human health criteria for toxic pollutants (EPA 1992). Criteria applicable to this facility's discharge are summarized below in Table 9.

- Aquatic Life Uses are designated based on the presence of, or the intent to provide protection for, the key uses. All indigenous fish and non-fish aquatic species must be protected in waters of the state in addition to the key species. The Aquatic Life Uses for this receiving water are identified below.

**Table 9: Aquatic Life Uses & Associated Criteria**

<b>Salmonid Spawning, Rearing, and Migration</b>	
Temperature Criteria – Highest 7DAD MAX	17.5°C (63.5°F)
Temperature Criteria – 1-DayMax	20.0°C due to human activities.
Dissolved Oxygen Criteria – Lowest 1-Day Minimum	8.0 mg/L
Turbidity Criteria	<ul style="list-style-type: none"> <li>• 5 NTU over background when the background is 50 NTU or less; or</li> <li>• A 10 percent increase in turbidity when the background turbidity is more than 50 NTU</li> </ul>
Total Dissolved Gas Criteria	Total dissolved gas shall not exceed 110 percent of saturation at any point of sample collection
pH Criteria	pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units

- The recreational uses are primary contact recreation. The recreational uses for this receiving water are identified below.

**Table 10: Recreational Uses and Associated Criteria**

<b>Recreational Use</b>	<b>Criteria</b>
Primary Contact Recreation	Fecal coliform organism levels must not exceed a geometric mean value of 100 colonies /100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 200 colonies /100 mL.

- The **water supply uses** are domestic, agricultural, industrial, and stock watering.
- The **miscellaneous freshwater uses** are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

#### E. Evaluation of Surface Water Quality-Based Effluent Limits for Numeric Criteria

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field).



Toxic pollutants, for example, are near-field pollutants—their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biological oxygen demand (BOD) is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred.

Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

With technology-based controls (AKART), predicted pollutant concentrations in the discharge exceed water quality criteria. Ecology therefore authorizes a mixing zone in accordance with the geometric configuration, flow restriction, and other restrictions imposed on mixing zones by chapter 173-201A WAC.

The treated and disinfected effluent flows into the Spokane River through a 36-inch diameter duckbill style Tideflex valve. The outfall extends north into the river about 75 feet beyond the ordinary high water level on the south bank of the river. Top of pipe is roughly 15 feet below the ordinary high water.

### **Chronic Mixing Zone**

WAC 173-201A-400(7)(a) specifies that mixing zones must not extend in a downstream direction from the discharge ports for a distance greater than 300 feet plus the depth of water over the discharge ports or extend upstream for a distance of over 100 feet, not utilize greater than **25%** of the flow, and not occupy greater than **25%** of the width of the water body.

### **Acute Mixing Zone**

WAC 173-201A-400(8)(a) specifies that in rivers and streams a zone where acute toxics criteria may be exceeded must not extend beyond 10% of the distance towards the upstream and downstream boundaries of the chronic zone, not use greater than **2.5%** of the flow and not occupy greater than **25%** of the width of the water body.

The dilution factors, shown in the table below, are predicted for the SCRWRF outfall in the Technical Memorandum *Task G102 – Mixing Zone and Water Quality Update* from Cosmopolitan Engineers to HDR Engineers representing Spokane County Utilities, dated October 29, 2007

**Table 11: Predicted Mixing Zone Dimensions and Dilution Factors by Cosmopolitan Engineers**

Season	Distance to mixing zone boundary		Dilution at mixing zone boundary		Plume Width at chronic mixing zone boundary (ft.)
	Acute (ft.)	Chronic (ft.)	Acute (ft.)	Chronic (ft.)	
<b>Summer</b>	<b>4.7</b>	<b>47</b>	<b>1.4</b>	<b>8.6</b>	<b>21</b>
<b>Winter</b>	<b>12</b>	<b>118</b>	<b>2.6</b>	<b>15</b>	<b>18</b>

**Table 12: Ecology determined Dilution Factors (DF)**

Criteria	Summer		Winter	
	Acute	Chronic	Acute	Chronic
Aquatic Life	1.77	11.89	2.41	20.90
Human Health, Carcinogen		35.72		64.44
Human Health, Non-carcinogen		16.78		28.86

Ecology determined the dilution factors in Table 12 using a summer 7Q20 of 573 cfs and a winter 7Q20 of 1047 cfs (Pelletier 1997).

Ecology will use the dilution zone determined by the County consultants for defining a maximum size for the dilution zone in the proposed permit. It reflects a future design flow of 12 MGD. Table 12 reflects dilution factors for a design flow of 8 MGD. Ecology determined the impacts of dissolved oxygen deficiency as part of the modeling for the Spokane River and Lake Spokane DO TMDL which was approved by the USEPA in May 2010.

Ecology determined the impacts of Temperature, pH, Fecal Coliform, Chlorine, Ammonia Toxicity, and Metals, as described below, using the dilution factors in the above Table 12. The derivation of surface water quality-based limits also takes into account the variability of pollutant concentrations in both the effluent and the receiving water.

### **Oxygen Demanding Pollutants**

The Spokane River and Lake Spokane (Long Lake) Dissolved Oxygen TMDL report sets WLAs for Total Phosphorus, CBOD<sub>5</sub>, and Ammonia for each NPDES discharger to the Spokane River. The TMDL's managed implementation plan outlines the approach Ecology will take to meet these waste load allocations (WLAs) and ultimately achieve the water quality standard for dissolved oxygen in Lake Spokane.

This approach is spread over a twenty year managed implementation plan (MIP). During the first ten years of the MIP, efforts focus on phosphorus reduction to the Spokane River.

Before the end of the first ten years of the MIP, a thorough assessment will provide any necessary information to guide actions for the second ten year period.

These second period actions will include continuation of successful measures conducted in the first 10 years, such as operation of the phosphorus treatment technology and other permanent phosphorous reduction efforts. They may also include new actions such as additional treatment technologies, consideration of river oxygenation, and/or reconsideration of Water Quality Standards applied to the River and Lake Spokane. If new information from the “Ten Year Assessment” justifies relaxing WLAs and the water quality-based effluent limits (WQBELs), Ecology will relax the WQBELs. If so, the following section in federal regulation regarding “anti-backsliding” applies:

*122.44(l) Reissued permits.*

*1) **Except as provided in paragraph (l)(2)** of this section when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under Sec. 122.62.)*

*(2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.*

*(i) **Exceptions**--A permit with respect to which paragraph (l)(2) of this section applies may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant, if--*

*Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance; or*

Ecology will establish WLAs and WQBELs on the best scientific information and interpretation available based on the facts that the “Ten Year Assessment” produces. Ecology will also examine and revise as needed the implementation of water quality based effluent limitations in terms of long term average versus monthly averages or maximums.

**CBOD<sub>5</sub>** - For the Spokane County Regional Water Reclamation Facility, SCRWRF, the Spokane River and Lake Spokane DO TMDL projects that compliance requires the effluent CBOD<sub>5</sub> concentration be less than 4.2 mg/L.

The effluent limitation will express this as a mass limit for the season March 1 to October 31 (245 days) of 280.2 lbs/day or 68,654 lbs total for the season.

**Phosphorus** - For the Spokane County Regional Water Reclamation Facility, SCRWRF, the Spokane River and Lake Spokane DO TMDL projects that compliance requires the effluent Total Phosphorus concentration be less 42 ug/L on a monthly average basis.

The effluent limitation will express the monthly average of 42 ug/L as a mass limit for the season March 1 to October 31 (245 days) of 2.80 lbs/day or 686.5 lbs total for the season.

**Ammonia** - For the Spokane County Regional Water Reclamation Facility, SCRWRF, the Spokane River and Lake Spokane DO TMDL projects that compliance requires the effluent ammonia to have less than the following loadings:

The following 3 seasons will have average mass per day limit as noted below:

1. For the season of March 1 to May 30, the allowable mass of  $\text{NH}_3$  is 55.4 lbs/day.
2. For the season of June 1 to September 30, the allowable mass of  $\text{NH}_3$  is 14.0 lbs/day.
3. For the season of October 1 to October 31, the allowable mass of  $\text{NH}_3$  is 55.4 lbs/day.

For the 3 parameters above, federal rules normally require publically owned treatment works to have effluent limitations to be expressed in terms of monthly and weekly averages and daily maximums for applicable toxicants. However, that is not a mandatory permit requirement and 40 CFR 122.45(d) does allow that if the normal monthly averages, weekly averages and daily maximum are impractical, alternatives such as an annual or seasonal limit may be appropriate. For the Spokane River and Spokane Lake system impractical means the water body does not respond in a measurable way to short term variations. Therefore, long term trend analysis and measurements descriptive of long term trends such as seasonal averages and seasonal totals are appropriate.

For the municipal dischargers to the Spokane River and Spokane Lake system impractical also means that reliable data sets with log normal distributions for conversion of maximums to averages do not exist. In Chesapeake Bay, EPA recognized that temperature affected plant performance resulting in a skewed data set, making it impracticable to establish monthly and weekly averages. For Chesapeake Bay the U.S. EPA cited reasons of temperature affecting plant performance resulting in a skewed data set. A skewed data set can also result when the low end of the data set is determined by the detection limit. Both reasons apply in this situation, leading to the conclusion that it is currently impracticable to establish monthly and weekly effluent limitations for all 3 parameters.

### **Pollutant Equivalencies and Alternate Effluent Limitations**

The County's approved Wastewater Facilities Plan (WWFP) amendment Chapter 2 (Final – June 2010) addressed pollutant equivalency through modeling using the CE-Qual-W2 model that established the Spokane River and Lake Spokane DO TMDL and WLAs.

With the technology selected, the CBOD<sub>5</sub> should be less than 2.0 mg/L. In fact the County's contract with the DBO contractor, CH2M Hill constructors requires the CBOD<sub>5</sub> be 2.0 mg/L or less.

The WWFP amendment considered 2 scenarios this capability provides. Both scenarios considered a TP of 50 ug/L or less. The scenarios were:

- 1) An ammonia excursion due to cold water temperatures and poor nitrification of up to 16 mg/L in March, the remainder of spring (April through May) at 1.0 mg/L, Summer (June through September) at 0.25 mg/L, and October at 1.0 mg/L
- 2) 1.0 mg/L for March through May, Summer (June through September) at 0.25 mg/L, and October at 1.0 mg/L

In both scenarios DO concentrations improve very slightly according to the CE-Qual-W2 model predictions, see table 2 of the Limno Tech memo of March 11, 2010 that is in the Wastewater Facilities Plan Amendment of June 2010. The model does justify the use of alternate effluent limitation due to the ability of the treatment processes to remove CBOD<sub>5</sub> to below 2.0 mg/L

In May of 2011, Limno Tech and Ecology both ran the CE-Qual-W2 model with alternate limits for Spokane County and the Idaho dischargers. In this run a 16 mg/L daily maximum for ammonia was considered for the County discharge with TP of 50 ug/L and CBOD<sub>5</sub> of 2.0 mg/L. This model run also confirmed the viability of alternate permit limits for a group of dischargers.

**Temperature** - The state temperature standards (WAC 173-201A-200-210 and 600-612) include multiple elements:

- Annual summer maximum threshold criteria (June 15 to September 15).
- Supplemental spawning and rearing season criteria (September 15 to June 15) but such are not defined for the Spokane River/
- Incremental warming restrictions.
- Protections against acute effects.

Ecology evaluates each criterion independently to determine reasonable potential and derive permit limits.

- Annual summer maximum and supplementary spawning/rearing criteria.

Each water body has an annual maximum temperature criterion [WAC 173-201A-200(1)(c), 210(1)(c), and Table 602]. These threshold criteria (e.g., 12, 16, 17.5, 20°C) protect specific categories of aquatic life by controlling the effect of human actions on summer temperatures.

Some waters, not the Spokane River, have an additional threshold criterion to protect the spawning and incubation of salmonids (9°C for char and 13°C for salmon and trout) [WAC 173-201A-602, Table 602]. These criteria apply during specific date-windows.

The threshold criteria apply at the edge of the chronic mixing zone. Criteria for most fresh waters are expressed as the highest 7-Day average of daily maximum temperature (7-DADMax).

The 7-DADMax temperature is the arithmetic average of seven consecutive measures of daily maximum temperatures. Criteria for marine waters and some fresh waters are expressed as the highest 1-Day annual maximum temperature (1-DMax).

- Incremental warming criteria

The water quality standards limit the amount of warming human sources can cause under specific situations [WAC 173-201A-200(1)(c)(i)-(ii), 210(1)(c)(i)-(ii)]. The incremental warming criteria apply at the edge of the chronic mixing zone.

At locations and times when background temperatures are cooler than the assigned threshold criterion, point sources are permitted to warm the water by only a defined increment.

These increments are permitted only to the extent doing so does not cause temperatures to exceed either the annual maximum or supplemental spawning criteria.

At locations and times when a threshold criterion is being exceeded due to natural conditions, all human sources, considered cumulatively, must not warm the water more than 0.3°C above the naturally warm condition.

When Ecology has not yet completed a temperature TMDL, our policy allows each point source to warm water at the edge of the chronic mixing zone by 0.3°C. This is true regardless of the background temperature and even if doing so would cause the temperature at the edge of a standard mixing zone to exceed the numeric threshold criteria. Allowing a 0.3°C warming for each point source is reasonable and protective where the dilution factor is based on 25% or less of the critical flow. This is because the fully mixed effect on temperature will only be a fraction of the 0.3°C cumulative allowance (0.075°C or less) for all human sources combined.

- Temperature Acute Effects

**Instantaneous lethality to passing fish:** The upper 99th percentile daily maximum effluent temperature must not exceed 33°C; unless a dilution analysis indicates ambient temperatures will not exceed 33°C 2-seconds after discharge.



**General lethality and migration blockage:** Measurable (0.3°C) increases in temperature at the edge of a chronic mixing zone are not allowed when the receiving water temperature exceeds either a 1DMax of 23°C or a 7DADMax of 22°C.

**Lethality to incubating fish:** Human actions must not cause a measurable (0.3°C) warming above 17.5°C at locations where eggs are incubating.

**Annual summer maximum, and incremental warming criteria:** Ecology calculated the reasonable potential for an assumed discharge temperature based on the City of Spokane operational data to exceed the annual summer maximum, and the incremental warming criteria at the edge of the chronic mixing zone during critical condition(s). No reasonable potential exists to exceed the temperature criterion where:

$$\begin{aligned} &(\text{Criterion} + 0.3) > (\text{Criterion} + (T_{\text{effluent}95} - \text{Criterion}))/\text{DF} \\ &(20 + 0.3) > (20 + (20.5 - 20))/11.89. \quad 20.3 > 1.72 \end{aligned}$$

Therefore, the proposed permit does not include a temperature limit. The permit requires additional monitoring of effluent and ambient temperatures. Ecology will reevaluate the reasonable potential during the next permit renewal.

**pH** - Ecology modeled the impact of the effluent pH on the receiving water using the calculations from EPA, 1988, and the chronic dilution factor of 11.89. The receiving water input variables used are listed above in Table 5. The effluent input variables used are assumed.

Under critical conditions, modeling predicts a violation of the pH criteria for the receiving water if the effluent pH drops below 7.0 with an ambient alkalinity of 40 mg/L CaCO<sub>3</sub> or less. Therefore, the proposed permit includes water quality-based effluent limits for pH of 7.0 to 9.0. The permit will require monitoring of alkalinity of the effluent and the receiving water.

**Fecal Coliform** – The approved design criteria is 200 colonies per 100ml (200 cfu/100mL) monthly average. Ecology modeled the numbers of fecal coliform by simple mixing analysis using the technology-based limit of 200 organisms per 100 mL and an acute dilution zone factor of 1.77. At the design value and with a 7Q10 flow the water quality standard would be exceeded slightly immediately beyond the acute mixing zone, 4.7 feet from the end of the tideflex valve. With the depth of the diffuser, small size of dilution zone, velocity of water, cobbly nature of the river bank and vegetation, there is no significant public health risk that the EPA guidance seeks to avoid. Additionally, the SCRWRF will perform much better than the approved design criteria. It is anticipated that the fecal coliform count will be below 100 cfu/100ml exiting the membranes and disinfection will reduce it further. Meeting the water quality criterion of 100 cfu/100 mL at end of pipe is attainable and very likely realized.

**Toxic Pollutants** - Federal regulations (40 CFR 122.44) require Ecology to place limits in NPDES permits on toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

The following toxic pollutants are present in the discharge: Ammonia, Chlorine, Heavy Metals, PCBs, Dioxins and PBDEs. Ecology conducted a reasonable potential analysis (See **Appendix D**) on these parameters to determine whether it would require effluent limits in this permit.

Ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature and pH in the receiving freshwater. To evaluate ammonia toxicity, Ecology used the available receiving water information for ambient stations and Ecology spreadsheet tools.

Valid ambient background data was available for ammonia, heavy metals and PCBs. Though for PCBs the quantity of data was limited. Ecology used all applicable data to evaluate reasonable potential for this discharge to cause a violation of water quality standards. The ambient stations were 54A120 and 57A150 for metals and hardness; 54A130, 57A125, 57A140 and 57A150 for conventional parameters.

Ecology determined that ammonia has no reasonable potential to exceed the toxicity water quality criteria. However, the County contract with CH2M Hill Constructors has maximum day limits based on higher flows than the first phase facility accommodates which are reflected in the permit. The no reasonable potential scenario was modeled using procedures given in EPA, 1991 (**Appendix D**).

The Heavy Metals TMDL requires either a performance based limit or a water quality based limit using the end of pipe hardness which is unknown. Ambient concentrations for Cadmium, Lead and Zinc exceed the water quality standards. The calculations for reasonable potential require a maximum effluent concentration which isn't available. Instead, the County's permit application proposed to use the effluents limits for the Riverside Park Water Reclamation Facility under the assumption that the influent pollutant concentrations would be similar. The SCRWRF will also be employing the next level of treatment, chemical addition and filtration, and would be expected to provide better metals removal than the current Riverside Park Water Reclamation Facility. Additionally, the SCRWRF has a larger dilution factor so that using RPWRF effluent limits for metals is deemed to be conservative and acceptable until operational data is available.

The resultant effluent limits are as follows:

Parameter	Average Monthly	Maximum Daily
Cadmium (total)	0.076 µg/L	0.233 µg/L
Lead (total)	0.772 µg/L	1.34 µg/L
Zinc (total)	53.8 µg/L	72.6 µg/L
Total Ammonia (as NH <sub>3</sub> -N)		
For "season" of March 1 to May 31	55.4 lbs/day	16 mg/L
For "season" of June 1 to Sept. 30	14.0 lbs/day	7.5 mg/L
For "season" of Oct. 1 to Oct. 31	55.4 lbs/day	16 mg/L

Water quality criteria for most metals published in chapter 173-201A WAC are based on the dissolved fraction of the metal (see footnotes to table WAC 173-201A-240(3); 2006).

Spokane County Utilities may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Ecology may adjust metals criteria on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

## **F. Whole Effluent Toxicity**

The water quality standards for surface waters forbid discharge of effluent that causes toxic effects in the receiving waters. Many toxic pollutants cannot be measured by commonly available detection methods. However, laboratory tests can measure toxicity directly by exposing living organisms to the wastewater and measuring their responses. These tests measure the aggregate toxicity of the whole effluent, so this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

- *Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent.* Dischargers who monitor their wastewater using acute toxicity tests find early indications of any potential lethal effect of the effluent on organisms in the receiving water.
- *Chronic toxicity tests measure various sublethal toxic responses, such as retarded growth or reduced reproduction.* Chronic toxicity tests often involve either a complete life cycle test on an organism with an extremely short life cycle, or a partial life cycle test during a critical stage of a test organism's life. Some chronic toxicity tests also measure organism survival.

Using the screening criteria in WAC 173-205-040, Ecology determined that the Spokane County Regional Water Reclamation Facility's effluent has the potential to cause aquatic toxicity based solely on probable influent characteristics. Spokane County has a delegated pretreatment program indicative of influent organic and inorganic compounds not necessarily removed by wastewater treatment adequately. To verify protection of beneficial uses, the proposed permit contains WET testing requirements as authorized by RCW 90.48.520 and 40 CFR 122.44, using procedures from WAC 173-205.

The proposed permit requires the facility to conduct WET testing at prescribed intervals for one year, to characterize both the acute and chronic toxicity of the effluent.

If the year of WET testing shows acute or chronic toxicity levels that have a reasonable potential to cause receiving water toxicity, then the proposed permit will:

- Set a limit on acute or chronic toxicity.
- Require this facility operator to conduct WET testing to monitor compliance with an acute toxicity limit, a chronic toxicity limit, or both.
- Specify the procedures the facility operator must use to come back into compliance if toxicity exceeds the limits.

Ecology-accredited WET testing laboratories use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format.

Accredited laboratory staff knows how to calculate an NOEC, LC<sub>50</sub>, EC<sub>50</sub>, IC<sub>25</sub>, etc. Ecology gives all accredited labs the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (<http://www.ecy.wa.gov/biblio/9580.html>), which is referenced in the permit. Ecology recommends that each regulated facility send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

If the WET tests performed for effluent characterization purposes indicate no reasonable potential to cause receiving water toxicity, the proposed permit will not impose WET limits, but will require rapid screening tests to detect any toxicity that may appear.

- If a rapid screening test indicates apparent effluent toxicity, the facility operator must investigate immediately, take appropriate action, and report to Ecology.
- If this facility makes process or material changes which, in Ecology's opinion, increase the potential for effluent toxicity, then Ecology may (in a regulatory order, by permit modification, or in the permit renewal) require the facility to conduct additional effluent characterization.
- If WET testing conducted as a follow-up to rapid screening tests fails to meet the performance standards in WAC 173-205-020, Ecology will assume that effluent toxicity has increased.

## **G. Human Health**

Washington's water quality standards include 91 numeric human health-based criteria that Ecology must consider when writing NPDES permits. These criteria were established in 1992 by the U.S. EPA in its National Toxics Rule (40 CFR 131.36). The National Toxics Rule allows states to use mixing zones to evaluate whether discharges comply with human health criteria.

The draft *Spokane River PCB Source Assessment 2003-2007* (Publication No. 11-03-013) identifies the various municipal discharges as sources of toxics such as PCBs to the Spokane River.

The draft source assessment estimates that a PCB load reduction in excess of 99% by all sources will be needed for compliances with the human health criterion for PCBs. The above effluent concentrations are from conventional secondary treatment. All three Washington municipal discharges will soon be employing tertiary treatment for phosphorus reduction including filtration. Further reduction of toxics, such as PCBs, is likely.

The permits for each NPDES discharger to the Washington section of the Spokane River has a narrative limit for PCBs requiring source identification, and control activities, establishment of performance based effluent limits leading to a long term goal of meeting applicable water quality standards. The permits also require the creation and participation in a Regional Toxics Task Force.

Not all toxicants of potential human health concern are not anticipated to be present, but periodic monitoring will be required to verify the absence of other human health toxicants.

Ecology evaluated the discharge's potential to violate the water quality standards as required by 40 CFR 122.44(d) by following the procedures published in the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001) and Ecology's *Permit Writer's Manual* to make a reasonable potential determination.

The evaluation showed that the discharge has no reasonable potential other than PCBs to cause a violation of water quality standards. A numeric effluent limit will be established based on plant performance in the next permit cycle. A plan for source control is needed (see V. Other Permit Conditions sections G & H).

## **H. Sediment Quality**

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400). You can obtain additional information about sediments at the Aquatic Lands Cleanup Unit website at <http://www.ecy.wa.gov/programs/tcp/smu/sediment.html>.

Through a review of the discharger characteristics and of the effluent characteristics, Ecology determined that this discharge has no reasonable potential to violate the sediment management standards due to pollutant removal efficiency, stream velocity and a lack of particulates in the river and effluent for pollutants to absorb to.

## **I. Ground Water Quality Limits**

The ground water quality standards (chapter 173-200 WAC) protect beneficial uses of ground water. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100).

The Spokane County Regional Water Reclamation Facility does not discharge wastewater to the ground. No permit limits are required to protect ground water.

## **IV. MONITORING REQUIREMENTS**

Ecology requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits.

The monitoring schedule is detailed in the proposed permit under Condition S2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (Publication Number 92-09) for a tertiary activated sludge treatment plant discharging over 5 MGD.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Biosolids monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

As a Pretreatment Publicly Owned Treatment Works (POTW), Spokane County Utilities is required to sample influent, primary clarifier effluent, final effluent, and sludge for toxic pollutants in order to characterize the industrial input. Sampling is also done to determine if pollutants interfere with the treatment process or pass-through the plant to the sludge or the receiving water. Spokane County Utilities will use the monitoring data to develop local limits which commercial and industrial users must meet.

#### **A. Lab Accreditation**

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, *Accreditation of Environmental Laboratories* to prepare all monitoring data (with the exception of certain parameters). The plan for start up of the facility is to use a contract laboratory initially, tentatively Anatek Labs, Inc. Approximately 6 months after start up, the SCRWRF's on site laboratory would commence the Ecology accreditation protocols.

#### **B. Receiving Water Monitoring**

Ecology monitors the ambient water quality upstream and downstream of the SCRWRF outfall, but not in a location to distinguish any water quality impact of the county discharge from other outfalls. This permit will require the County to monitor the upstream and downstream water quality for a number of conventional parameters and metals in the second and fourth years of the permit.

#### **C. Effluent Limits Which are Near Detection or Quantitation Levels**

The water quality-based effluent concentration limits for total phosphorus are near the limits of current analytical methods to detect or accurately quantify.

The method detection level (MDL) is the minimum concentration of a pollutant that can be measured and reported with a 99 percent confidence that its concentration is greater than zero (as determined by a specific laboratory method). The quantitation level is the level at which concentrations can be reliably reported with a specified level of error.

Estimated concentrations are the values between the MDL and the QL. Ecology requires estimated concentrations to be reported.

When reporting maximum daily effluent concentrations, Ecology requires the facility to report "less than X" where X is the required detection level if the measured effluent concentration falls below the detection level. When calculating average monthly concentrations, the facility must use all the effluent concentrations measured below the quantitation level but above the method detection level. USEPA guidance states that when any sample analyzed in accordance with a method having the appropriate MDL and QL and found to be below the QL will be considered in compliance with the permit limits unless other monitoring information indicates a violation.

## **V. OTHER PERMIT CONDITIONS**

### **A. Reporting and Record Keeping**

Ecology based permit condition S3. on our authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 173-220-210).

### **B. Prevention of Facility Overloading**

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 requires Spokane County to take the actions detailed in proposed permit requirement S4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S4. restricts the amount of flow.

### **C. Operation and Maintenance (O&M)**

The proposed permit contains Condition S5. as authorized under RCW 90.48.110, WAC 173-220-150, chapter 173-230 WAC, and WAC 173-240-080. Ecology included it to ensure proper operation and regular maintenance of equipment, and to ensure that Spokane County and CH2M Hill Constructors, Inc will take adequate safeguards so that it uses the constructed facilities to their optimum potential in terms of pollutant capture and treatment.

The proposed permit requires submission of an O&M manual.

### **D. Pretreatment**

#### **Duty to Enforce Discharge Prohibitions**

The City of Spokane and Spokane County are Co-Permittees for the pretreatment sections of the City of Spokane's NPDES Permit for the Riverside Park Water Reclamation Facility.

The County's permit pretreatment section for its new water reclamation facility will therefore match the County's pretreatment section of the City's permit for which they are a Co-Permittee.

This pretreatment provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer.

A meeting was held on October 20, 2004 at the Department of Ecology Eastern Regional Office on the subject of Spokane-area pretreatment. The following are items that staff of the Department of Ecology, City of Spokane, Spokane County, and the City of Spokane Valley agreed upon pertaining to Delegated Pretreatment Programs in the Spokane area:

1) Spokane County has the authority to administer its Delegated Pretreatment Program to their present and future sewer customers located within their designated sewer service areas in Spokane County and in the City of Spokane Valley.

For the purpose of this meeting, this applies to customers who contribute wastewater into the Spokane County sewer collection system and are located outside of the corporate limits of the City of Spokane and within the City of Spokane Valley and Spokane County. Existing permitted facilities that this applies to are Ecolite Mfg Co., Galaxy Compound Semiconductors, Inc.; Honeywell Electronic Materials, Inc.; Lloyd Industries LLC, Kemira Water System, American On-Site Services and Novation, Inc. in the City of Spokane Valley, and the Mica Landfill in Spokane County.

The County acknowledges that as owner and operator of a wastewater collection system it has the responsibility to protect its infrastructure, and by agreement the infrastructure of the downstream POTW, and accepts the obligations of a Delegated Pretreatment Program. The City may through its Multi-Jurisdictional agreement request the County to serve select city customer's and exercise appropriate pretreatment authority over the discharger.

2) The City of Spokane has the authority to administer its delegated Pretreatment Program to their present and future sewer customers located within its designated sewer service areas in City of Spokane Valley, in Spokane County, and in the City of Spokane. For the purpose of this meeting, this applies to customers who contribute wastewater into the City of Spokane sewer collection system and are located either within or outside of the corporate limits of the City of Spokane. Existing permitted facilities that this applies to are Brenntag Pacific in the City of Spokane Valley, and Goodrich, Johnna Beverages, and Reliance Trailer in the West Plains Area of Spokane County. The City acknowledges that as owner and operator of a wastewater collection system and POTW it is their responsibility to protect their infrastructure, and accepts the obligations of a Delegated Pretreatment Program.

3) Both the City of Spokane and Spokane County, as the control authority for their Delegated Pretreatment Programs, will continue to enforce and update, if necessary and appropriate, their interlocal agreements and/or multijurisdictional pretreatment agreements with "contributing" jurisdictions such as Millwood, and Airway Heights. Some of these actions may include conducting Industrial User Surveys, monitoring, and permitting commercial and/or industrial users.

4) The agreements reached in the October 20, 2004 meeting are based upon individual and collective understanding of applicable laws, rules, regulations, and agreements pertaining to NPDES pretreatment requirements and programs in Washington State, and upon legal opinions provided by Spokane County and the City of Spokane Valley dated October 11, 2004 and October 12, 2004 respectively.

An industrial user survey is required to determine the extent of compliance of all industrial users of the sanitary sewer and wastewater treatment facility with federal pretreatment regulations (40 CFR Part 403 and Sections 307(b) and 308 of the Clean Water Act), with state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC), and with local ordinances.

As sufficient data becomes available, the Permittees shall, in consultation with the Ecology, reevaluate their local limits in order to prevent pass through or interference. Upon determination by the Ecology that any pollutant present causes pass through or interference, or exceeds established sludge standards, the Permittees shall establish new local limits or revise existing local limits as required by 40 CFR 403.5.



In addition, Ecology may require revision or establishment of local limits for any pollutant that causes an exceedance of the Water Quality Standards or established effluent limits, or that causes whole effluent toxicity. The maximum effluent concentration reported in the City of Spokane's NPDES application does not exceed the reasonable potential criterion for mercury. However, Mercury in the Riverside Park Reclaimed Water Facilities effluent equaled or exceeded the chronic water quality criteria seven times from January 2002 through October 2004. It is Ecology's determination that the Permittees need to develop and implement a mercury abatement and control program. Additional Mercury Plan development guidance can be found at the following locations:

Ecology Mercury Website: <http://www.ecy.wa.gov/mercury/>  
For Dental Plan Guidance: <http://www.ecy.wa.gov/dentalbmps/index.html>  
Reduction Plan Guidance: <http://www.ecy.wa.gov/biblio/0303001.html>

Ecology may modify this permit to incorporate additional requirements relating to the establishment and enforcement of local limits for pollutants of concern

### **Requirements for Performing an Industrial User Survey**

This POTW has the potential to serve significant industrial or commercial users and is required to perform an Industrial User Survey. The goal of this survey is to develop a list of SIUs and PSIUs, and of equal importance, to provide sufficient information about industries which discharge to the POTW, to determine which of them require issuance of State waste discharge permits or other regulatory controls. An Industrial User Survey is an important part of the regulatory process used to prevent interference with treatment processes at the POTW and to prevent the exceedance of water quality standards. The Industrial User Survey also can be used to contribute to the maintenance of sludge quality, so that sludge can be a useful biosolids product rather than an expensive waste problem.

An Industrial User Survey is a rigorous method for identifying existing, new, and proposed significant industrial users and potential significant industrial users. A complete listing of methodologies is available in Ecology's guidance document entitled "Conducting an Industrial User Survey".

- The first section of the pretreatment requirements prohibits the POTW from accepting pollutants which causes "Pass-through" or "Interference". This general prohibition is from 40 CFR §403.5(a). **Appendix C** of this fact sheet defines these terms.
- The second section reinforces a number of specific State and Federal pretreatment prohibitions found in WAC 173-216-060 and 40 CFR §403.5(b). These reinforce that the POTW may not accept certain wastes, which:
  - Are prohibited due to dangerous waste rules.
  - Are explosive or flammable.
  - Have too high or low of a pH (too corrosive, acidic or basic).
  - May cause a blockage such as grease, sand, rocks, or viscous materials.
  - Are hot enough to cause a problem.
  - Are of sufficient strength or volume to interfere with treatment.

- Contain too much petroleum-based oils, mineral oil, or cutting fluid.
- Create noxious or toxic gases at any point.

40 CFR Part 403 contains the regulatory basis for these prohibitions, with the exception of the pH provisions which are based on WAC 173-216-060.

- The third section of pretreatment conditions reflects state prohibitions on the POTW accepting certain types of discharges unless the discharge has received prior written authorization from Ecology.

These discharges include:

- Cooling water in significant volumes.
- Stormwater and other direct inflow sources.
- Wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Ecology delegated authority to Spokane County Utilities for permitting, monitoring, and enforcement over industrial users discharging to their treatment system to provide more direct and effective control of pollutants.

Ecology oversees the delegated Industrial Pretreatment Program to assure compliance with federal pretreatment regulations (40 CFR Part 403) and categorical standards and state regulations (chapter 90.48 RCW and chapter 173-216 WAC).

As sufficient data becomes available, Spokane County Utilities must, in consultation with Ecology, reevaluate its local limits in order to prevent pass-through or interference. If any pollutant causes pass-through or interference, or exceeds established sludge standards, Spokane County Utilities must establish new local limits or revise existing local limits as required by 40 CFR 403.5.

In addition, Ecology may require revision or establishment of local limits for any pollutant that causes a violation of water quality standards or established effluent limits, or that causes whole effluent toxicity.

Ecology may modify this permit to incorporate additional requirements relating to the establishment and enforcement of local limits for pollutants of concern.

## **E. Solid Waste Control**

To prevent water quality problems the facility is required in permit Condition S7. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state water quality standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under chapter 70.95J RCW, chapter 173-308 WAC "Biosolids Management," and chapter 173-350 WAC "Solid Waste Handling Standards." The disposal of other solid waste is under the jurisdiction of the Spokane County Health District.

Requirements for monitoring sewage sludge and record keeping are included in this permit. This information will be used by Ecology to develop or update local limits and is also required under 40 CFR 503.

## **F. Spill Plan**

This facility stores a quantity of chemicals on-site that normally would have the potential to cause water pollution if accidentally released. Ecology can require a facility to develop best management plans to prevent this accidental release [Section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080]. However, the City of Spokane requires secondary containment of storage vessels and connections. Further best management plans are not necessary.

## **G. Toxic Source Control Action Plan**

As described in III.C Anti-degradation and III.G Human Health, an action plan for identifying and controlling sources of toxics is needed. Known wastewater treatment technologies can not reduce influent PCBs adequately to meet current water quality standards for PCBs. What PCBs are removed are transferred to the biosolids which is less than an optimum option. Source control is essential.

- An Annual Toxics Management Report shall be prepared by the County and submitted to Ecology on an annual basis for review and evaluation on the PCB management effort. Activities planned for PCB reduction in the subsequent year of operation shall be jointly reviewed and agreed upon.
- The Toxics Management Plan is implementing a narrative effluent limit for PCBs. As such the Plan has 2 goals.
  - To reduce toxicant loadings, including PCBs, to the Spokane River to the maximum extent practicable realizing statistically significant reductions in the influent concentration of toxicants to the SCRWRF over the next 10 years.
  - Reduce PCBs in the effluent to the maximum extent practicable so that in time the effluent does not contribute to PCBs in the Spokane River exceeding applicable water quality standards.

## **H. Regional Toxics Task Force**

During development of the proposed permit, the Spokane Riverkeeper expressed concerns about PCBs and water quality standards compliance to Spokane County.

As a result, Spokane County and the Spokane Riverkeeper put forth the idea of a Regional Toxics Task Force and offered up a number of ideas as to its functions and structure. While the initial concept was directed at PCBs as the primary toxicant, the River does have a 303(d) listing for dioxin in fish tissue. The Washington State Water Quality Standards do not have a criterion for PBDEs, but sampling by Ecology has shown elevated concentrations of PBDEs. PBDEs are now banned in some states, including Washington and presumably will be decreasing, but that was thought to be true of PCBs at one time.

The focus of the Task Force is appropriately on 303(d) listed toxics such as PCBs, however source identification and reduction efforts should not overlook opportunities to reduce the levels of PBDEs when possible.

The Spokane Tribe of Indians expressed very similar concerns. The tribal representatives are supportive of narrative limits with clearly stated goals (stated above).

Ecology does not want to be prescriptive regarding the organization and structure of a Task Force, but believes cooperative action is in the best interest of all stakeholders. Ecology also believes the time for action is now. Therefore, the rudiments of a Regional Toxics Task Force are described in the permit, but many details are left for the NPDES Permittees and other stakeholders to cooperatively develop.

The proposed permit does require the creation of a Regional Toxics Task Force and participation in it. The Task Force and Ecology's "Spokane River Toxics Reduction Strategy" are intended to avoid the need for a PCB TMDL and initiate source reduction and clean up actions sooner than if a TMDL came first. However, Ecology does have the obligation to use its regulatory authority to bring the river's water quality into compliance with applicable water quality standards. If the proposed Task Force approach is not successful, other means and methods will be employed including the option of a PCB TMDL.

It is anticipated that activities of the Task Force will begin with the following:

- (1) Identify data gaps and collect necessary data on PCBs and other toxics on the 2008 year 303(d) list for the Spokane River;
- (2) Further analyze the existing and future data to better characterize the amounts, sources, and locations of PCBs and other toxics on the 2008 year 303(d) list for the Spokane River;
- (3) Prepare recommendations for controlling and reducing the sources of listed toxics in the Spokane River;
- (4) Review proposed Toxic Management Plans, Source Management Plans, and BMPs;
- (5) Monitor and assess the effectiveness of toxic reduction measures;
- (6) Identify a mutually agreeable entity to serve as the clearinghouse for data, reports, minutes, and other information gathered or developed by the Task Force and its members. This information shall be made publicly available by means of a website and other appropriate means;

To accomplish the above tasks it is anticipated that the Task Force will need technical assistance in the person of an independent consultant.

Ecology, the US EPA Region X and Spokane Tribal representatives have conferred on this and are supportive of the Task Force creation and objectives.

For each Washington discharger to the Spokane River, Ecology is requiring prompt action on the concept and the proposed permit is requiring that:

- (1) By **November 30, 2011**, the Permittee shall provide Ecology with the organizational structure, specific goals, funding and the governing documents of the Regional Toxics Task Force.

## **I. General Conditions**

Ecology bases the standardized General Conditions on state and federal law and regulations. They are included in all individual municipal NPDES permits issued by Ecology.

## **VI. PERMIT ISSUANCE PROCEDURES**

### **A. Permit Modifications**

Ecology may modify this permit to impose numerical limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for ground waters, based on new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state or federal regulations.

### **B. Proposed Permit Issuance**

This proposed permit meets all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of five (5) years.

## VII. REFERENCES FOR TEXT AND APPENDICES

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*Cadmium, Copper, Mercury, Lead and Zinc in the Spokane River*, (Publication 94-09)

Final Draft *Spokane River PCB Source Assessment 2003-2007* (Publication No. 11-03-013)

## **APPENDIX A - PUBLIC INVOLVEMENT INFORMATION**

Ecology proposes to issue a permit to the Spokane County Regional Water Reclamation Facility. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology placed a Public Notice of Application on November 22, 2010 and November 29, 2010 in the Spokesman Review to inform the public about the submitted application and to invite comment on the issuance of this permit.

Ecology will place a Public Notice of Draft on June 28, 2011 in the Spokesman Review to inform the public and to invite comment on the proposed draft National Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Tells where copies of the draft permit and fact sheet are available for public.
- Offers to provide the documents in an alternate format to accommodate special needs.
- Asks people to tell us how well the proposed permit would protect the receiving water.
- Invites people to suggest fairer conditions, limits, and requirements for the permit.
- Invites comments on Ecology's determination of compliance with antidegradation rules.
- Urges people to submit their comments, in writing, before the end of the comment period.
- Tells how to request a public hearing about the proposed NPDES permit.
- Explains the next step(s) in the permitting process.

Ecology has published a document entitled *Frequently Asked Questions about Effective Public Commenting* which is available on our website at <http://www.ecy.wa.gov/biblio/0307023.html>.

You may obtain further information from Ecology by telephone at (509) 329-3519 or by writing to the address listed below.

Mr. Richard Koch  
Department of Ecology  
Eastern Regional Office  
4601 North Monroe Street  
Spokane, WA 99205-1295  
[rkoc461@ecy.wa.gov](mailto:rkoc461@ecy.wa.gov)

The primary author of this permit and fact sheet is Richard A. Koch, P.E



## APPENDIX B - YOUR RIGHT TO APPEAL

You have a right to appeal this permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of the final permit. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2) (see glossary).

To appeal you must do the following within 30 days of the date of receipt of this permit:

- File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this permit on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

### ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
<b>Department of Ecology</b> Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503  <b>Pollution Control Hearings Board</b> 1111 Israel RD SW STE 301 Tumwater, WA 98501	<b>Department of Ecology</b> Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608  <b>Pollution Control Hearings Board</b> PO Box 40903 Olympia, WA 98504-0903

## **APPENDIX C – GLOSSARY**

**1-DMax or 1-Day Maximum Temperature** - The highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of thirty minutes or less.

**7-DADMax or 7-Day Average of the Daily Maximum Temperatures** - The arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.

**Acute Toxicity** - The lethal effect of a compound on an organism that occurs in a short time period, usually 48 to 96 hours.

**AKART** - The acronym for “all known, available, and reasonable methods of prevention, control and treatment.” AKART is a technology-based approach to limiting pollutants from wastewater discharges, which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and 520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

**Alternate Point of Compliance** - An alternative location in the ground water from the point of compliance where compliance with the ground water standards is measured. It may be established in the ground water at locations some distance from the discharge source, up to, but not exceeding the property boundary and is determined on a site specific basis following an AKART analysis. An “early warning value” must be used when an alternate point is established. An alternate point of compliance must be determined and approved in accordance with WAC 173-200-060(2).

**Ambient Water Quality** - The existing environmental condition of the water in a receiving water body.

**Ammonia** - Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

**Annual Average Design Flow (AADF)** - Average of the daily flow volumes anticipated to occur over a calendar year.

**Average Monthly Discharge Limit** - The average of the measured values obtained over a calendar month's time.

**Background Water Quality** - The concentrations of chemical, physical, biological or radiological constituents or other characteristics in or of ground water at a particular point in time upgradient of an activity that has not been affected by that activity, [WAC 173-200-020(3)].

Background water quality for any parameter is statistically defined as the 95% upper tolerance interval with a 95% confidence based on at least eight hydraulically upgradient water quality samples. The eight samples are collected over a period of at least one year, with no more than one sample collected during any month in a single calendar year.

**Best Management Practices (BMPs)** - Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

**BOD<sub>5</sub>** - Determining the five-day Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD<sub>5</sub> is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD<sub>5</sub> is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

**Bypass** - The intentional diversion of waste streams from any portion of a treatment facility.

**Categorical Pretreatment Standards** - National pretreatment standards specifying quantities or concentrations of pollutants or pollutant properties, which may be discharged to a POTW by existing or new industrial users in specific industrial subcategories.

**Chlorine** - A chemical used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

**Chronic Toxicity** - The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

**Clean Water Act (CWA)** - The federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

**Compliance Inspection-Without Sampling** - A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

**Compliance Inspection-With Sampling** - A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

In addition it includes as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Ecology may conduct additional sampling.

**Composite Sample** - A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

**Construction Activity** - Clearing, grading, excavation, and any other activity, which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

**Continuous Monitoring** - Uninterrupted, unless otherwise noted in the permit.

**Critical Condition** - The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

**Date of Receipt** - This is defined in RCW 43.21B.001(2) as five business days after the date of mailing; or the date of actual receipt, when the actual receipt date can be proven by a preponderance of the evidence. The recipient's sworn affidavit or declaration indicating the date of receipt, which is unchallenged by the agency, constitutes sufficient evidence of actual receipt. The date of actual receipt, however, may not exceed forty-five days from the date of mailing.

**Detection Limit** - See Method Detection Level.

**Dilution Factor (DF)** - A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, for example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

**Distribution Uniformity** - The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

**Early Warning Value** - The concentration of a pollutant set in accordance with WAC 173-200-070 that is a percentage of an enforcement limit. It may be established in the effluent, ground water, surface water, the vadose zone or within the treatment process. This value acts as a trigger to detect and respond to increasing contaminant concentrations prior to the degradation of a beneficial use.

**Enforcement Limit** - The concentration assigned to a contaminant in the ground water at the point of compliance for the purpose of regulation, [WAC 173-200-020(11)]. This limit assures that a ground water criterion will not be exceeded and that background water quality will be protected.

**Engineering Report** - A document that thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or 173-240-130.

**Fecal Coliform Bacteria** - Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

**Grab Sample** - A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

**Ground Water** - Water in a saturated zone or stratum beneath the surface of land or below a surface water body.

**Industrial User** - A discharger of wastewater to the sanitary sewer that is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

**Industrial Wastewater** - Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

**Interference** - A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
- Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

**Local Limits** - Specific prohibitions or limits on pollutants or pollutant parameters developed by a POTW.

**Major Facility** - A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Maximum Daily Discharge Limit** - The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Maximum Day Design Flow (MDDF)** - The largest volume of flow anticipated to occur during a one-day period, expressed as a daily average.

**Maximum Month Design Flow (MMDF)** - The largest volume of flow anticipated to occur during a continuous 30-day period, expressed as a daily average.

**Maximum Week Design Flow (MWDF)** - The largest volume of flow anticipated to occur during a continuous 7-day period, expressed as a daily average.

**Method Detection Level (MDL)** - The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the pollutant concentration is above zero and is determined from analysis of a sample in a given matrix containing the pollutant.

**Minor Facility** - A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Mixing Zone** - An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The permit specifies the area of the authorized mixing zone that Ecology defines following procedures outlined in state regulations (chapter 173-201A WAC).

**National Pollutant Discharge Elimination System (NPDES)** - The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

**pH** - The pH of a liquid measures its acidity or alkalinity. It is the negative logarithm of the hydrogen ion concentration. A pH of 7 is defined as neutral and large variations above or below this value are considered harmful to most aquatic life.

**Pass-Through** - A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

**Peak Hour Design Flow (PHDF)** - The largest volume of flow anticipated to occur during a one-hour period, expressed as a daily or hourly average.

**Peak Instantaneous Design Flow (PIDF)** - The maximum anticipated instantaneous flow.

**Point of Compliance** - The location in the ground water where the enforcement limit must not be exceeded and a facility must comply with the Ground Water Quality Standards. Ecology determines this limit on a site-specific basis. Ecology locates the point of compliance in the ground water as near and directly downgradient from the pollutant source as technically, hydrogeologically, and geographically feasible, unless it approves an alternative point of compliance.

**Potential Significant Industrial User (PSIU)** - A potential significant industrial user is defined as an Industrial User that does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

Ecology may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

**Quantitation Level (QL)** - Also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to  $(1,2,\text{or } 5) \times 10^n$ , where n is an integer. (64 FR 30417).

ALSO GIVEN AS:

The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency December 2007).

**Reasonable Potential** - A reasonable potential to cause a water quality violation, or loss of sensitive and/or important habitat.

**Responsible Corporate Officer** - A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

**Significant Industrial User (SIU) -**

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority\* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement [in accordance with 40 CFR 403.8(f)(6)].

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority\* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

\*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

**Slug Discharge** - Any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge to the POTW. This may include any pollutant released at a flow rate that may cause interference or pass through with the POTW or in any way violate the permit conditions or the POTW's regulations and local limits.

**Soil Scientist** - An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5,3, or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

**Solid Waste** - All putrescible and non-putrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.



**Soluble BOD<sub>5</sub>** - Determining the soluble fraction of Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of soluble organic material present in an effluent that is utilized by bacteria. Although the soluble BOD<sub>5</sub> test is not specifically described in Standard Methods, filtering the raw sample through at least a 1.2 um filter prior to running the standard BOD<sub>5</sub> test is sufficient to remove the particulate organic fraction.

**State Waters** - Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

**Stormwater** - That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

**Technology-Based Effluent Limit** - A permit limit based on the ability of a treatment method to reduce the pollutant.

**Total Coliform Bacteria** - A microbiological test, which detects and enumerates the total coliform group of bacteria in water samples.

**Total Dissolved Solids (TDS)** - That portion of total solids in water or wastewater that passes through a specific filter.

**Total Suspended Solids (TSS)** - Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

**Upset** - An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

**Water Quality-Based Effluent Limit** - A limit imposed on the concentration of an effluent parameter to prevent the concentration of that parameter from exceeding its water quality criterion after discharge into receiving waters.

## APPENDIX D – TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on Ecology's homepage at <http://www.ecy.wa.gov/programs/eap/pwsread/pwsread.html>.

Effluent and Receiving Water Critical Conditions									
Facility: <b>SCRWRF</b>				Design Case: <b>Reasonable Potential - low flow</b>					
Receiving Water: <b>Spokane River above Green St</b>									
CLICK HERE FOR INSTRUCTIONS	Effluent Data			Receiving Water Data					
	Annual Average Flow	Monthly Average Flow	Daily Maximum Flow	7Q10 Critical Flow	30Q5 Critical Flow	Harmonic Mean Flow	%flow for dilution		
Flow (MGD)	8.00	8.50	12.00	370.33	518.46	1110.99	25		
(cfs)	12.38	13.15	18.57	573.00					
Critical Temp (1DMax or 7DADMax) °C	20.00			18.10					
(°F)	68.0			64.6					
Critical Hardness (mg/L CaCO3)	120.00			56.50					
Critical pH (s.u.)	7.00			8.06					
Critical Alkalinity (mg/L as CaCO3)	100.00			55.00					
Enter own pH & Temp for Ammonia Criteria?	n			Enter own Dilution Factors (DFs)?			n		
pH		Temp (°C)		Acute DF					
@ Acute Boundary				Chronic DF					
@ Chronic Boundary				Human Health (non C) DF					
				Human Health (Carcn) DF					
	@ Acute Boundary	@ Chronic Boundary	Whole River Dilution (@ 7Q10 Flow)	@ 30Q5 River Flow (non C)	@Harmonic Mean River Flow (Carcn)				
Dilution Factor	1.77	11.89	44.57	16.25	35.72				
(% effluent)	56.45	8.41	2.24	6.15	2.80				
Hardness	92.34	61.84	57.92	-	-				
Alkalinity	80.40	58.78	56.01	-	-				
Max pH (s.u.)	7.14	7.67	7.91	-	-				
Max Temp (°C)	19.17	18.26	18.14	-	-				
Max Temp (°F)	66.51	64.87	64.66	-	-				
Pollutant, Effluent, and Receiving Water Data				Facility: SCRWRF					
				Receiving Water: Spokane River above Green St					
				Design Case: Reasonable Potential - low flow					
				Enter RW Data					
				Enter Effluent Data					
				max effluent concentration (measured)					
				# of data points					
				Coefficient of Variation					
				#samples per month for compliance monitoring					
				50% percentile effluent conc for HH RPD, when n>10 (leave blank otherwise)					
				Ambient Concentration					
Pollutant, CAS No. & Application Ref. No.	priority pollutant?	standard	acute	chronic	acute	chronic	Probability (0.95 - WQ Based; 0.5 - Human Health)	ug/L	ug/L
AMMONIA, unionized	N	WQ Std	21061.6	1689.4	0.0	0.0	0.95	8.0	12

*Fact Sheet for NPDES Permit WA-009331-7*  
*Spokane County Regional Water Reclamation Facility*

Summary of Effluent Reasonable Potential Determination & Limits										Facility Receiving Water Design Case		SCRWRF Spokane River above Green St Reasonable Potential - low flow				
										Receiving Water	Acute Boundary		Chronic Boundary		Permit Limits	
POLLUTANT										Upstream RW Conc. µg/L	RW Acute Criteria, µg/L	Conc @ Acute MZ Boundary, µg/L	RW Chronic (or Human Health) Criteria, µg/L	Conc @ Chronic (or Human Health) MZ Boundary, µg/L	Daily Maximum Limit, µg/L	Monthly Average Limit, µg/L
AMMONIA, unionized	N	WQ Stnd	13.0	Maximum Expected (or 50%) Effluent Concentration, µg/L	Does reasonable potential exist?	NO	0.02	21061.6	7.348	1689.4	1.112					

## **APPENDIX E – RESPONSE TO COMMENTS**

The public notice that informed the public that a draft permit was available for review was published in the Spokesman Review on June 28, 2011. Ecology received comments on the draft permit following the 30-day public comment period. All comments and Ecology's responses are attached to this fact sheet as Attachment A.

## APPENDIX F – REVISED TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on Ecology's homepage at <http://www.ecy.wa.gov/programs/eap/pwsread/pwsread.html>.

Commenter on the fact sheet noted a data entry mistake. The entry for maximum effluent concentration should have been 8000 ug/L instead of 8 ug/L. The corrected reasonable potential calculation for ammonia follows:

Pollutant, Effluent, and Receiving Water Data											Facility		SCRWRF																	
											Receiving Water		Spokane River above Green St																	
											Design Case		Reasonable Potential - low flow																	
													Enter Effluent Data				Enter RW Data													
					priority pollutant?		standard		acute		chronic		acute		chronic		Probability (0.95 - WQ Based; 0.5 - Human Health)		max effluent concentration (measured)		# of data points		Coefficient of Variation		#samples per month for compliance monitoring		50% percentile effluent conc for HH RPD, when n>10 (leave blank otherwise)		Ambient Concentration	
Pollutant, CAS No. & Application Ref. No.																			ug/L										ug/L	
AMMONIA, unionized					N		WQ Stnd		21061.6		1689.4		0.0		0.0		0.95		8000.0		12		0.6		12				0.02	

## **APPENDIX G**

### **Guidance on Water Quality Based Effluent Limits Set Below Analytical Detection/Quantitation Limits**



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
1200 Sixth Avenue  
Seattle, WA 98101**

April 25, 2005

**MEMORANDUM**

**SUBJECT:** Guidance on Water Quality Based Effluent Limits Set Below Analytical Detection/Quantitation Limits

**FROM:** Cindi Godsey, NPDES Permits Unit  
Michael Lidgard, Manager, NPDES Permits Unit  
Kim Ogle, Manager, NPDES Compliance Unit

**TO:** NPDES Permits Unit Consistency Book

The purpose of this memorandum is to provide guidance to EPA Region 10 permit writers and compliance staff, for permitting, monitoring, and enforcement of water quality-based effluent limits set below the analytical detection/quantitation limit. This guidance is for effluent limits that are greater than zero but less than the minimum level (ML).

NPDES permits must include the water quality based effluent limit regardless of the proximity of the limit to the analytical detection level. Where the effluent limit concentration is below the analytical detection level for the pollutant of concern the following is recommended:

- The NPDES permit should include the most sensitive Method Detection Level (MDL) from an EPA approved analytical test method necessary for compliance monitoring. The analytical test method should be approved under 40 CFR 136, or other appropriate method if one is not available under 40 CFR 136. The permit should also identify the ML as the compliance level.
- The NPDES permit should state that any sample analyzed in accordance with a method having the appropriate MDL and ML and found to be below the ML will be considered in compliance with the permit limits unless other monitoring information indicates a violation.
- The permit should specify how samples should be reported. Suggested language: For purposes of reporting on the DMR for a single sample, if a value is less than the MDL, the permittee must report "less than {numeric value of the MDL}" and if a value is less than the ML, the permittee must report "less than {numeric value of the ML}."

Where more than one sample is being considered, the permit should specify how effluent samples below the ML should be utilized for purposes of averaging. Suggested language: For purposes of calculating monthly averages, zero may be assigned for values less than the MDL, the {numeric value of the MDL} may be assigned for values between the MDL and the ML. If the average value is less than the MDL, the permittee must report "less than {numeric value of the MDL}" and if the average value is less than the ML, the permittee must report "less than {numeric value of the ML}." If a value is equal to or greater than the ML, the permittee must report and use the actual value. The resulting average value must be compared to the compliance level, the ML, in assessing compliance.

- Special conditions should be included in the permit which help ensure that the limits are being met and that excursions above water quality standards are not occurring. Special conditions could include: fish tissue sampling, sediment monitoring, limits/monitoring on internal wastestreams, or limits/monitoring for surrogate parameters.

### **RATIONALE**

EPA's recommended approach in the *Technical Support Document for Water Quality-based Toxics Control*, EPA, March 1991 (TSD, chapter 5, section 5.7.3), includes:

- The NPDES permit should include the most sensitive analytical test method that should be used for compliance monitoring. The analytical test method should be approved under 40 CFR 136, or other appropriate method if one is not available under 40 CFR 136.
- The NPDES permit should state that any sample analyzed in accordance with the specified method and found to be below the compliance level will be considered in compliance with the permit limit unless other monitoring information indicates a violation.
- Sample results at or above the ML should be reported as the observed concentrations whereas sample results below the compliance level should be reported as less than this level.
- The compliance level cited in the permit must be clearly defined and quantified. For most NPDES permitting situations, EPA recommends that the compliance level be defined in the permit as the ML. The ML is the level at which the entire analytical system gives recognizable mass spectra and acceptable calibration points.
- Special conditions should be included in the permit which help ensure that the limits are being met and that excursions above water quality standards are not occurring. Special conditions could include: fish tissue sampling, limits/monitoring on internal wastestreams, or limits/monitoring for surrogate parameters.



The TSD does not recommend an approach for averaging multiple sample results below the ML. However, a memorandum entitled *Questions and Answers on the Great Lakes Water Quality Guidance, Set 2* (March 20, 1996; James Hanlon, Deputy Director of the Office of Science and Technology), states:

In the case of determining compliance with average limitations, permitting authorities shall use applicable State and Tribal procedures to average and account for monitoring data (see Procedure 8, Section A.4 ) and, .... Permitting authority may have various approaches for specifying how effluent samples below the LOQ should be regarded for purposes of averaging (e.g., equal to zero, equal to one-half the LOQ, etc.).

## **DEFINITIONS**

**Limit of quantization** means the smallest amount of chemical that can be reliably quantitated.

**Method Detection Limit** means the minimum concentration of a substance (analyte) that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte (see 40 CFR 136 Appendix B).

**Minimum Level** means the concentration at which the entire analytical system must give a recognizable signal and an acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method-specified sample weights, volumes and processing steps have been followed (*Technical Support Document for Water Quality-based Toxics Control*, EPA, March 1991).